

ANNUAL REPORT

1978

# noranda

AR19

EXPLORATION

MINING

METALLURGY

PETROLEUM

MANUFACTURING

FOREST PRODUCTS

MARKETING

---

## Annual Meeting

April 27, 1979, 2:30 p.m.  
Royal York Hotel, Toronto

---

## Table of contents

Five Year Financial Summary	1
Directors and Officers	2
Directors' Report	3
Markets	6
Exploration & Development	9
Research	11
Environmental Control	11
Mining & Metallurgy	12
Manufacturing	18
Forest Products	20
Effects of Inflation	22
Accounting Policies & Financial Statements	23
Divisional Results	31
An Economic Perspective	32
Operating Interests	back cover

---

## Head Office

P.O. Box 45,  
Commerce Court West,  
Toronto, M5L 1B6

---

## Transfer Agent and Registrar

Canada Permanent Trust Company,  
Toronto, Vancouver, Calgary, Saskatoon,  
Winnipeg, Montreal, Saint John, N.B.,  
Halifax, Charlottetown and St. John's,  
Nfld.

The Chase Manhattan Bank, New York,  
N.Y.

---

*An English or French edition of this Report  
may be obtained from the head office of the  
Company.*

*On peut se procurer la version française ou  
anglaise de ce rapport en en faisant la  
demande au siège social de la compagnie,  
B.P. 45, Commerce Court West, Toronto,  
Ontario M5L 1B6*

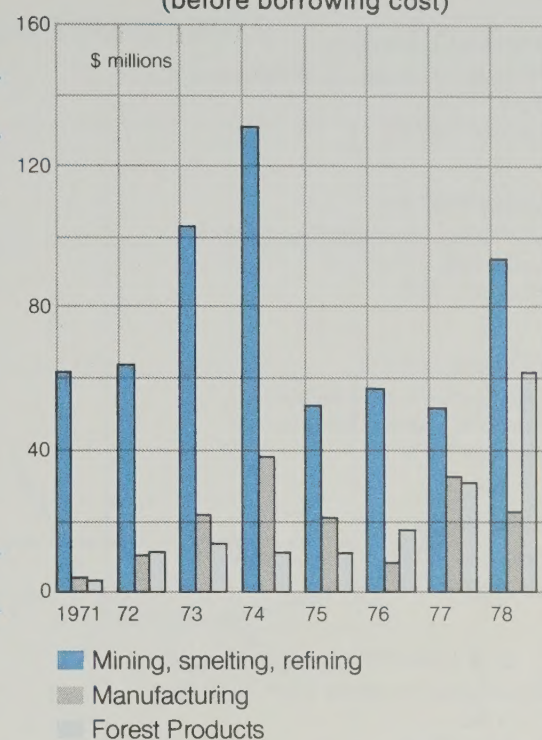
---

In this report unless indicated otherwise, — divisions and/or companies are wholly owned; production is for the calendar year 1978; tons mean short tons of 2,000 lbs.; mineral inventories are as at Dec. 31 / 78 and financial data is in Canadian dollars.

*This report, excepting the cover, is printed on  
Fraser BP Opaque, English Finish paper.*

**Five Year Financial Summary** (\$ in millions)

	1978	1977	1976	1975	1974
<b>Earnings —</b>					
Revenue	1,691.1	1,395.8	1,234.8	1,159.3	1,151.9
Expense —					
excluding interest	1,426.0	1,250.3	1,118.1	1,046.5	889.9
Interest expense	64.8	71.9	61.7	45.3	33.8
Income taxes	90.5	22.7	25.1	41.5	106.6
Minority interest in profits of subsidiaries	24.8	12.6	10.1	10.1	17.1
Earnings of Noranda and subsidiaries	85.0	38.3	19.8	15.9	104.5
Share of after-tax profits in associated companies	49.3	33.5	26.9	34.6	50.4
Earnings	135.2	71.8	46.7	50.5	154.9
<b>Financial Position —</b>					
Capital employed —					
Working capital	281.6	167.3	197.5	188.0	182.9
Investments and advances	410.0	387.8	361.9	372.2	326.0
Fixed assets — net	958.8	898.0	855.5	805.5	685.0
Other assets	123.3	115.8	118.5	104.6	90.8
	1,773.7	1,568.9	1,533.4	1,470.3	1,284.7
Capital sources —					
Shareholders' equity	884.4	758.7	715.3	696.4	692.8
Long-term debt	604.1	588.9	603.4	533.1	383.7
Minority interest in subsidiaries	150.9	128.2	120.3	114.4	99.9
Other	134.3	93.1	94.4	126.4	108.3
	1,773.7	1,568.9	1,533.4	1,470.3	1,284.7
<b>Changes in Financial Position —</b>					
Sources —					
From operations	218.3	145.9	83.9	126.9	244.3
Long-term financing (net)	15.2	(10.1)	70.3	139.3	38.4
Other (net)	8.3	(3.1)	8.8	1.0	8.9
	241.8	132.7	163.0	267.2	291.6
Application —					
Dividends	30.7	28.3	28.3	47.2	42.3
Capital expenditure —					
Fixed assets	115.1	119.6	115.6	158.2	101.7
Investments and advances (net)	(2.1)	7.3	(21.9)	31.0	73.4
Other, including acquisitions	(16.1)	7.6	31.6	25.7	37.9
Increase (decrease) in working capital	114.2	(30.1)	9.4	5.1	36.3
	241.8	132.7	163.0	267.2	291.6
<b>Share data —</b>					
Per share —					
Earnings	\$ 5.72	3.04	1.98	2.14	6.59
Dividends (class "A")	\$ 1.30	1.20	1.20	2.00	1.80
Market price range High	\$39.00	34.38	39.75	39.75	54.00
Low	\$20.63	19.63	26.37	27.25	26.63
Shares outstanding	25,182,544	24,464,511	24,463,886	24,451,266	24,442,441

**Earnings by division**  
(before borrowing cost)**Divisional Results**

Earnings	1978	1977
(in thousands)		
Mining and Metallurgical (net)	\$94,044	\$51,783
Manufacturing	22,517	33,131
Forest Products	61,681	30,277
	178,242	115,191
Less: cost of borrowing (net of tax)	43,068	43,415
Net earnings	135,174	71,776

**Employees**

(totals for Group and associates)

Canada	1978	1977
Mining and Metallurgy	14,200	14,500
Manufacturing	5,000	4,600
Forest Products	12,700	12,200
Total	31,900	31,300
International (mainly associates)	19,400	18,400

**Ownership**

December 31, 1978

	Registered Shareholders	Ownership
Canada	24,000	93%
U.S.A.	1,700	4%
Other	500	3%

## Directors

**James C. Dudley,**  
President, Dudley & Wilkinson Inc.,  
New York  
Elected 1970

**Louis Hébert,**  
Chairman, Banque Canadienne  
Nationale, Montreal  
Elected 1968

\* **William James,**  
Executive Vice-President,  
Noranda Mines, Toronto  
Elected 1968

\* **A. J. Little,**  
Company Director, Toronto  
Elected 1974

**L. G. Lumbers,**  
Chairman, Noranda Manufacturing,  
Toronto  
Elected 1962

**Thomas H. McClelland,**  
Chairman, Placer Development Ltd.,  
Vancouver  
Elected 1975

**D. E. Mitchell,**  
President and Chief Executive Officer,  
Alberta Energy Company Ltd., Calgary  
Elected 1973

**André Monast,**  
Partner in the legal firm of  
Létourneau & Stein, Quebec  
Elected 1966

\* **Alfred Powis,**  
Chairman and President,  
Noranda Mines, Toronto  
Elected 1964

\* **W. S. Row,**  
Chairman, Kerr Addison Mines Limited,  
Toronto  
Elected 1960

\* **W. P. Wilder,**  
President and Chief Executive Officer,  
The Consumers' Gas Company, Toronto  
Elected 1966

\* **Adam H. Zimmerman,**  
Executive Vice-President,  
Noranda Mines, Toronto  
Elected 1974

\* **Member of the Executive Committee**

## Officers

**Alfred Powis,**  
Chairman and President

**William James,**  
Executive Vice-President

**Adam H. Zimmerman,**  
Executive Vice-President

**R. C. Ashenhurst,**  
Secretary

**E. K. Cork,**  
Vice-President — Treasurer

**D. H. Ford,**  
Vice-President — Comptroller

**J. A. Hall,**  
Vice-President — Mine Projects

**K. C. Hendrick,**  
Vice-President — Sales

**J. O. Hinds,**  
Executive Assistant to the President

**R. L. Pepall,**  
Consulting Counsel

**R. P. Riggin,**  
Vice-President — Corporate Relations

**D. E. G. Schmitt,**  
Vice-President — Mines

**B. H. Grose,**  
Assistant Secretary

**W. J. Barbour,**  
Assistant Treasurer

**B. C. Bone,**  
Assistant Treasurer

## Honorary Directors

**J. R. Bradfield,** Honorary Chairman

**F. M. Connell**

**A. O. Dufresne**

**R. V. Porritt**

**J. D. Simpson**

**L. H. Timmins**

# Directors' Report

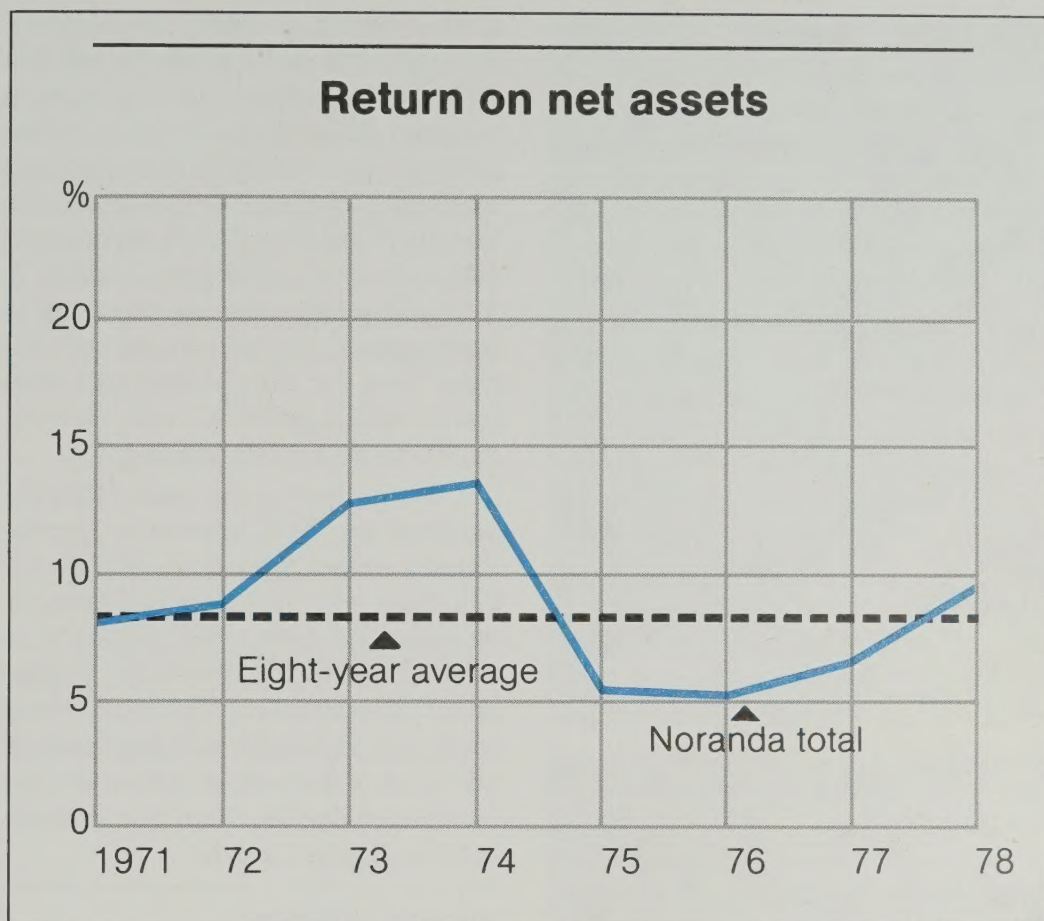
## EARNINGS AND DIVIDENDS

Earnings of \$135 million in 1978 were substantially better than expected a year ago, although they still provided an inadequate return on investment even valued at historical costs. Earnings per share from the various divisions were as follows:

Earnings Per Share	1978	Restated 1977	Average 1974-78
From:			
Mining & Metallurgy	\$3.98	\$2.20	\$3.29
Manufacturing	.95	1.40	1.04
Forest products	2.61	1.28	1.11
	\$7.54	\$4.88	\$5.44
Less: cost of borrowing	1.82	1.84	1.55
	\$5.72	\$3.04	\$3.89
Return on net assets	9.8%	6.6%	7.8%

The quarterly dividend rate was maintained at 30¢ per share during the first nine months, the same rate as during the previous two years. In the fourth quarter, in recognition of the improving trend of earnings, the rate was increased to 40¢ bringing total payments for the year to \$1.30 per share.

The most significant factor affecting 1978 results was the decline in the value of the Canadian dollar which during the year averaged 87¢ U.S. compared with 94¢ in 1977. The prices of virtually all mine and forest products are quoted in, or related to, U.S. dollars, and a reduction in the value of our currency results in a corresponding increase in the price of these products expressed in Canadian dollars. The effect on domestic manufacturing operations is less direct, but the result is to make them more competitive with favourable impacts on both volume and price. As a rough estimate, each 1¢ decline adds \$5 million to annual earnings after taxes and while there is a partial offset due to the need to revalue foreign currency debts, it is clear that much of the improvement in earnings was the result of the reduced value of the Canadian dollar.



Two unusual items had offsetting effects on 1978 results. The shutdown of the U.S. aluminum reduction plant as a result of the coal strike caused abnormal expenses of 41¢ per share. On the other hand, a profit on the sale of two sawmills in British Columbia increased earnings by 45¢ per share.

Mining and metallurgical results were favourably affected by a partial recovery in copper and zinc prices and strong markets for molybdenum, zinc and gold. Offsetting factors were a strike at Mines Gaspé which began in October and reduced fourth quarter earnings by 37¢ per share, and the impact of continued inflation on operating costs. Comparisons with 1977, however, should be put in the context of the fact that mining and metallurgical results that year were at their worst level since 1970.

In the absence of the extraordinary expense resulting from the involuntary shutdown of the aluminum reduction plant, manufacturing earnings in 1978 would have been similar to the restated earnings of the preceding year. Within this total, however, was a sharp improvement in domestic results partly offset by a reduction in

foreign earnings — largely the result of the loss of revenues (in addition to the extraordinary expenses) resulting from the shutdown.

Even without the gain on the sale of the sawmills, forest products earnings would have increased to a record level. Lumber and paper markets remained strong throughout the year and, in the second half, there was a partial recovery in the market for pulp. As with the other divisions, however, the exchange rate was a decisive factor. Had the U.S. and Canadian dollar been at par throughout the year, forest products earnings from operations would have been 43% lower.

The geographic breakdown of operating earnings in 1977 and 1978 before exploration and common costs was as follows:

	1978	1977
Maritime provinces	12%	6%
Quebec	31	25
Ontario	10	11
Western provinces	29	32
Total Canada	82	74
Foreign	18	26
Total	100	100

## MAJOR DEVELOPMENTS

Effective December 31, Noranda and Orchan Mines amalgamated and in January, 1979, a merger with Mattagami Lake Mines was completed. Noranda already had a substantial investment in those companies, whose mines are a major source of feed for the Canadian Electrolytic Zinc plant at Valleyfield, Que. Under one ownership, more rational operations will be possible both at the mines and at the zinc plant. These mergers will increase Noranda's net shares outstanding by 4.0 million to 27.6 million. Had these mergers been in effect throughout 1978, earnings per share would have been reduced by 4.7% before any allowance for improved efficiency. However, Noranda's financial position will be materially strengthened as indicated by the pro forma balance sheet shown on Page 24.

The Canadian Hunter program continued to add substantially to potential reserves of natural gas. Effective August 1, an agreement was reached under which a subsidiary of Imperial Oil may earn up to a 12½% interest in the Elmworth/Wapiti properties and a 17½% interest in all other properties in return for expenditures of up to \$180 million, largely on drilling and seismic operations. Noranda's net investment in this program to the end of 1978 has been \$103 million, of which \$14.8 million has been written off against earnings, and it will have a direct interest of 64.6% in the Elmworth/Wapiti properties and 60.4% in all others.

At the year-end, the \$91 million rebuild of Fraser Companies' pulp mill at Edmundston, N.B. was nearing completion, with costs apparently within budget. During the year, a \$42 million expansion of Fraser's paper-making capacity at Madawaska, Maine was begun with completion scheduled for 1980. The \$300 million pulp and lumber complex at St. Felicien, Que., in which British Columbia Forest Products has a 40% interest, was complete by year-end with costs within the budgeted amount.

As previously indicated, two sawmills in the Southern Interior of British Columbia were sold for \$18.6 million

plus working capital. In addition, arrangements were made to sell the Bell Copper mine for a price of between \$22 million and \$25 million plus working capital, but at year-end approval of this transaction under the Foreign Investment Review Act had not been obtained. Effective January 2, 1979, an aluminum sheet rolling mill at Huntingdon, Tennessee (about 100 miles from the New Madrid reduction plant) was purchased with working capital for some \$40 million U.S.

At the end of the year, Noranda acquired the 49% interest in Central Canada Potash previously held by CF Industries, Inc. The latter had become discouraged about the prospect of ever achieving a return on capital under Saskatchewan tax laws. However, CF Industries will continue to buy most of the output of the mine for resale to its member farm cooperatives in the U.S. and Canada.

## FINANCIAL POSITION

Capital spending (including deferred development) by Noranda and its subsidiaries during 1978 totalled \$124 million (before asset disposals) compared with \$141 million the previous year. Major items included \$49 million on the Fraser Companies' projects and \$27 million related to the Canadian Hunter program, the balance comprising a large number of routine expenditures needed to keep facilities in efficient operating condition.

Despite the continued high level of capital spending, there was a marked improvement in Noranda's financial position during 1978. Operations of Noranda improved working capital by \$101.8 million. Short term debt declined by \$106.8 million while long term debt increased by \$15.2 million. The amalgamation with Orchan at year-end 1978, and the merger with Mattagami Lake in January 1979 which is reported pro forma, further increased working capital by \$82.1 million and increased shareholders' equity by \$133.1 million.

## GENERAL BUSINESS ENVIRONMENT

In past annual reports we have dealt with the serious problems created for

industry — and the likely adverse impact on Canada's economic performance — resulting from accelerating inflation, an uncompetitive cost structure, a general hostility towards profits, and the resulting erosion of business and investor confidence. There were encouraging signs during 1978 that the debilitating results of these problems are becoming more widely recognized. At the same time, the further decline in the value of the Canadian dollar during 1978 has generally restored the country's cost competitiveness.

It is unfortunate that a depreciation in the value of the currency was necessary to make Canada competitive, and it is essential that our costs and inflation be controlled if further substantial devaluations are to be avoided. In this regard, stated government policies to encourage industrial expansion and reduce the public sector's share of the gross national product are encouraging. Just as it took some time for the adverse results of past mistaken policies to become apparent, this new direction will not produce an overnight cure. If pursued with determination and patience, however, these policies should ultimately restore Canada's economic health.

There was little tangible progress toward establishing a rational system of mining taxation in Canada during 1978. However, there was a growing recognition by various governments that the present chaotic and perverse system is slowly strangling the industry, and there is some reason for optimism that concrete progress may be possible in 1979.

## OPPOSITE

Views from the Annual General Meeting held April 28, 1978.

From top rt. —

Mr. Ashenurst reading notice of meeting with Mr. James sitting.

Mr. Zimmerman addressing meeting while Mr. Powis listens.

Mr. Gray of Canadian Hunter responding to a question from the floor as Mr. Cork listens.

Part of the audience of shareholders, employees and visitors.

OUTLOOK

The recent forecasting record of Noranda's management has not been particularly good. In last year's annual report, it was correctly forecast that the economic recovery would continue to be sluggish and uneven, and it was therefore assumed that 1978 would be another difficult year for Noranda. Actually, it was considerably better than expected due to the unforeseen further decline in the value of the Canadian dollar particularly in the second half of the year.

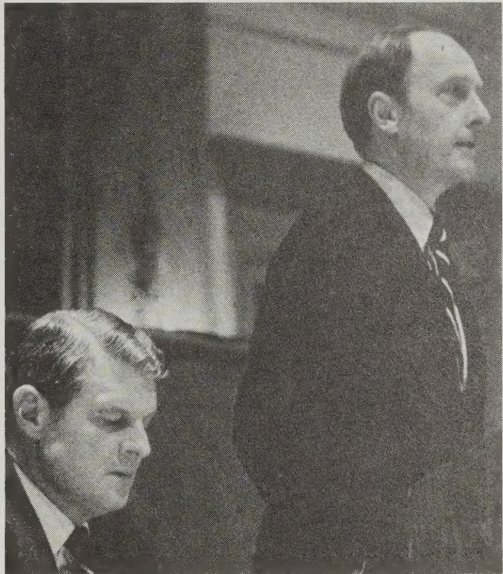
For 1979, a further improvement in earnings will be possible if product prices and currency values remain near present levels and no serious production interruptions occur. However, with a heavy collective bargaining calendar free of controls, with currency values being completely unpredictable, and with most forecasters expecting a U.S. recession, any optimism about 1979 must be tempered with caution. Moreover, the apparent improvement in earnings must be related to the depreciated replacement value of assets, which is at least double the historical costs shown in the balance sheet.

Longer term, the outlook is encouraging. Noranda's financial strength is being restored, government policy seems to be on the right track, product prices must eventually recover to levels that will encourage new capacity, and the Canadian Hunter program is expected to have a favourable impact on results. It appears that a good foundation is being established for the 1980's.

On behalf of the Board,

*Alfred Davis*  
Chairman and President.

Toronto, Ontario. February 20, 1979.



# Markets

## Mine Products

1978 was characterized by improved consumption, production interruptions, increased exports to the East Bloc countries and declining inven-

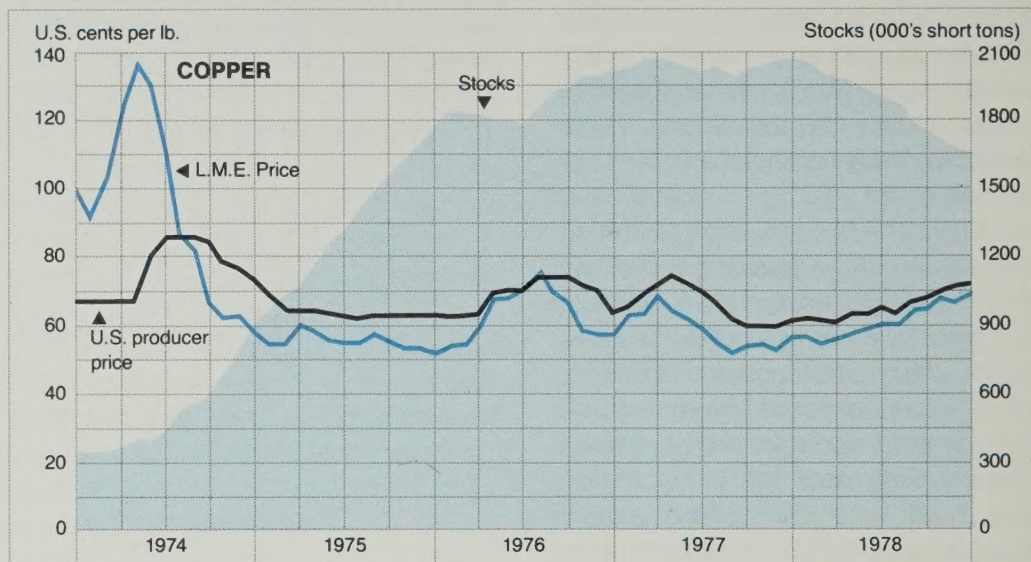
tories. The resultant better market balance, combined with currency changes, caused dollar prices to rise significantly.

### COPPER

WESTERN WORLD BALANCE — '000 Short Tons			
	1976	1977	1978
Supply	7,314	7,604	7,446
Consumption	7,087	7,535	7,898
Year-end Stocks	2,017	2,086	1,634

Consumption rose 4.8% surpassing the previous high, set in 1973, as economic activity was sustained in the major industrialized countries and strengthened in the developing countries. Mine cutbacks in the United States, political disturbances and transport problems in Africa, strikes in Canada and increased demand from Russia and China caused stocks to decline by 450,000 tons.

Early in 1978 the U.S. industry filed an escape clause petition with the International Trade Commission, arguing that increased imports were a substantial cause of injury. In September, President Carter disallowed any relief.



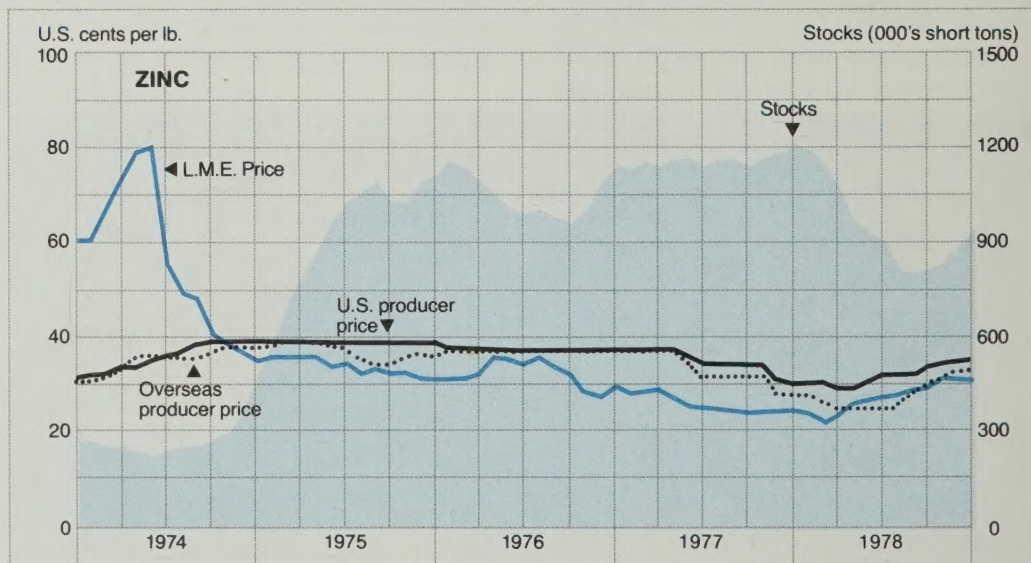
Prices early in the year were unsettled at low levels but a generally rising trend developed about mid-year. The London Metal Exchange quotation rose from U.S. 58½¢ to 71½¢ during the year. In the U.S.A., three U.S. producers adopted a Commodity

Exchange based price causing other producers to change their published prices more frequently as they increased from 65¢ to 73¢ over the second half. Canadian prices followed, adjusted for the lower value of the Canadian dollar.

### ZINC

WESTERN WORLD BALANCE — '000 Short Tons			
	1976	1977	1978
Supply	4,600	4,720	4,575
Consumption	4,575	4,650	4,850
Year-end Stocks	1,145	1,215	940

Initially, the market was uncertain in the face of a forecast slowdown in the U.S. economy and the escape clause action by the U.S. producers for quotas and higher duties. Aggressive discounting in Europe led to price reductions of \$50 to U.S. \$550 per metric ton overseas and 1.5¢ to 29¢ per lb. in the U.S.A. Prospects brightened in the second quarter as consumption improved, smelter production declined, and the Japanese Government stockpiled 90,000 tons. In addition, the International Trade Commission determined that the U.S. domestic



producers were not being seriously injured or threatened by imports.

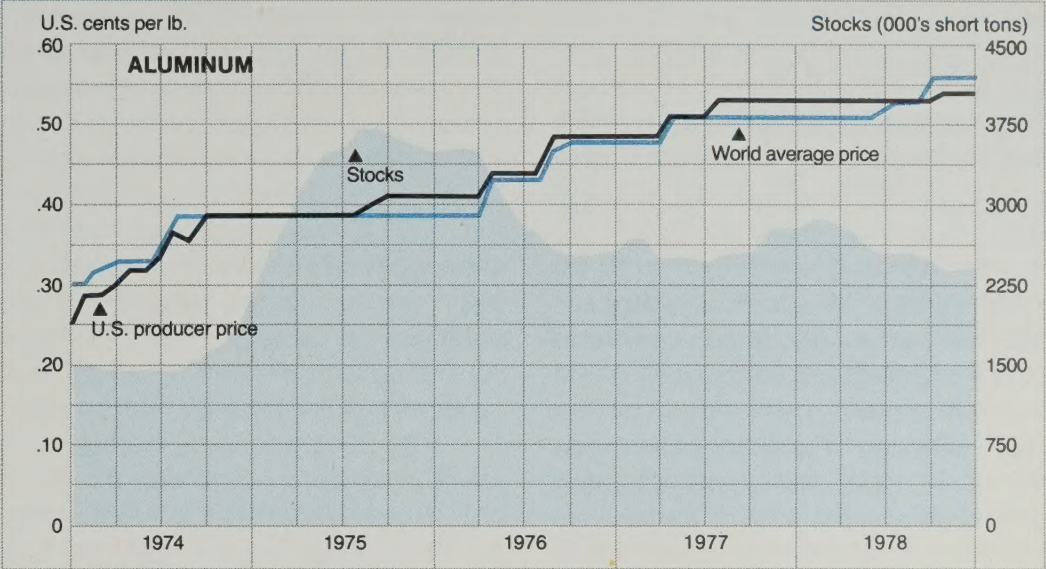
By year-end, consumption had risen by 4%, metal stocks had been reduced by 275,000 tons and the sur-

plus of mine concentrate had been largely eliminated by mine strikes and East Bloc imports. As a result, prices recovered in stages to \$720 overseas and 34.5¢ in the U.S.A.

ALUMINUM

WESTERN WORLD PRIMARY ALUMINUM BALANCE — '000 Short Tons			
	1976	1977	1978
Supply	10,050	12,235	12,544
Consumption	11,940	12,030	12,962
Year-end Stocks	2,550	2,755	2,337

World primary aluminum production was modestly higher as European and U.S. smelters operated in excess of 90% of capacity. However, Japanese production declined to 60% of capacity. Consumption was strong in all markets with European demand growing rapidly towards year-end. The world price increased to U.S. 56¢ per pound by year-end.

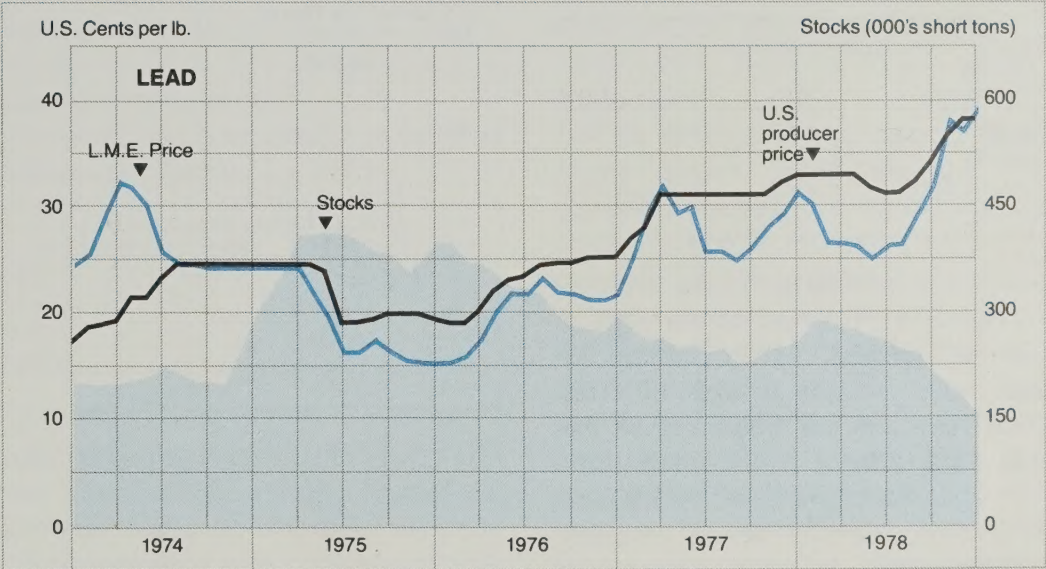


LEAD

WESTERN WORLD BALANCE — '000 Short Tons			
	1976	1977	1978
Supply	3,820	4,030	3,950
Consumption	3,920	4,060	4,060
Year-end Stocks	290	260	150

Consumption was unchanged as lower use for gasoline additives was offset by continuing strong battery demand. Production was down due to labour disruptions.

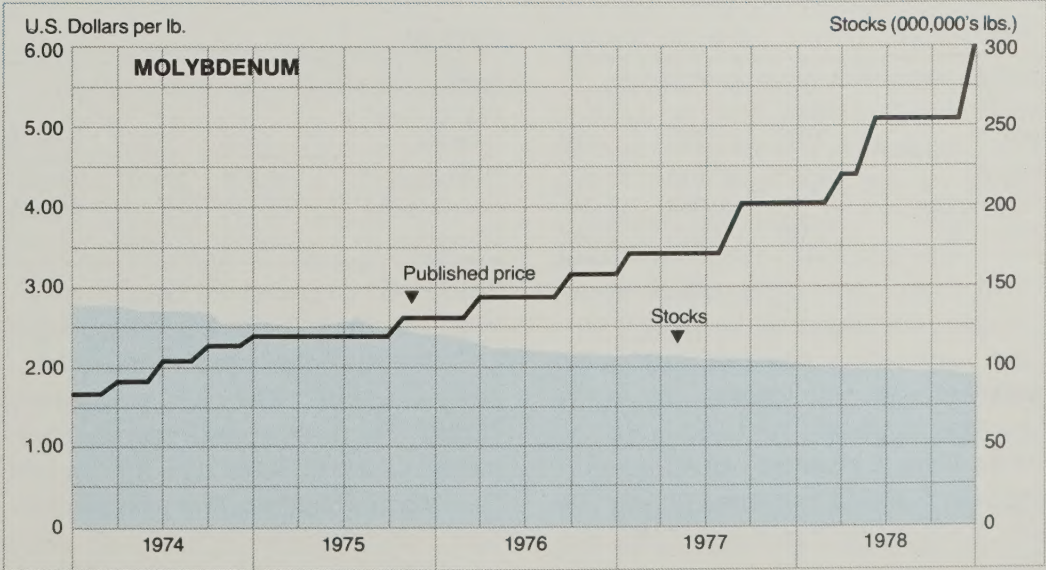
Despite low stocks, prices eased after the peak winter demand period by 2¢ to 31¢ in the U.S.A. and by 6¢ to U.S. 25¢ on the London Metal Exchange. Then in the second half prices reacted strongly, reaching 38¢ in the U.S.A. and 41¢ on the LME by year-end as stocks fell further.



MOLYBDENUM

WESTERN WORLD BALANCE — '000,000 lbs.			
	1976	1977	1978
Supply	167	179	186
Consumption	177	186	192
Year-end Stocks	108	101	95

The strong demand for molybdenum in high strength, low alloy steels and other ferro alloys was maintained throughout the year and applications for lubricants and catalysts also expanded. On the horizon is the large requirement for Arctic pipeline steels. Prices rose in three stages from \$4.01 to U.S. \$6.00 per pound for molybdenum contained in concentrate.



## SILVER

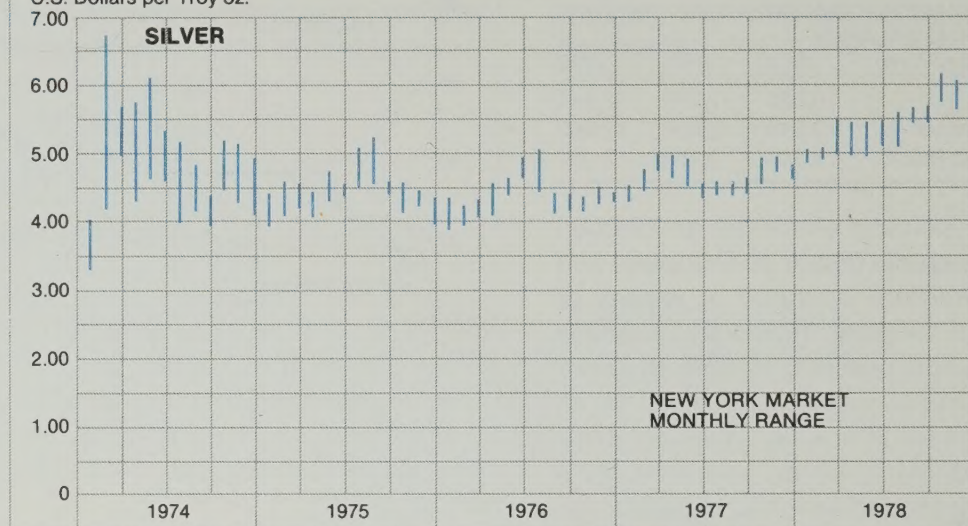
### WESTERN WORLD BALANCE — '000,000

Troy Ounces	1976	1977	1978
Supply — Primary	247	261	260
— Secondary	229	171	160
Consumption	440	422	448
Surplus (Deficit)	36	10	(28)

With consumption up 6% and supplies from India down, prices increased from U.S. \$4.82 to \$6.02 per ounce.

Uncertainty over action by the U.S. Government to change the quantity of stockpile silver was an influencing factor.

U.S. Dollars per Troy oz.



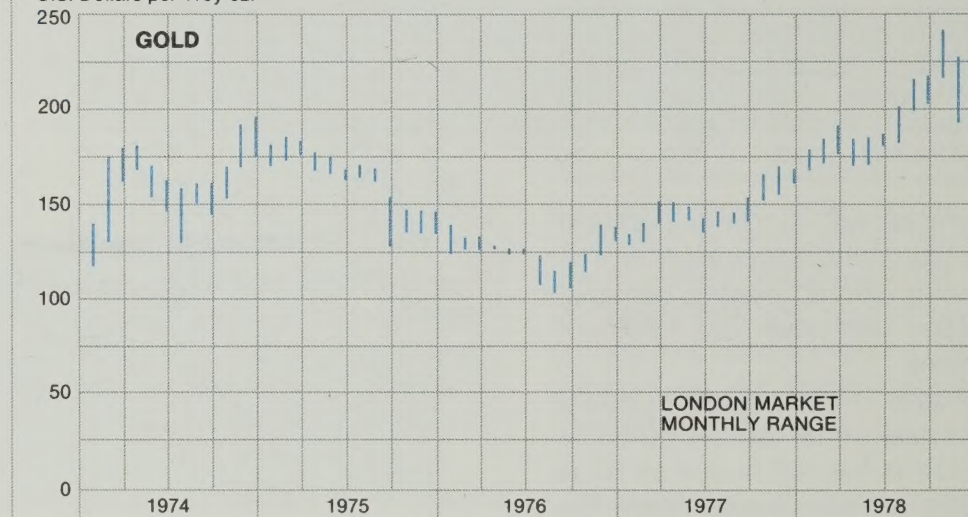
## GOLD

### WESTERN WORLD BALANCE — '000,000

Troy Ounces	1976	1977	1978
Supply	46.7	51.7	54.0
Industrial Consumption	44.1	44.6	46.5
Balance	2.6	7.1	7.5

The gold price rose from a low in January of U.S. \$166.30 per ounce to an all time high of \$243.65 on October 31 and ended the year at \$224.50. This trend reflected the weakness of the U.S. dollar against major foreign currencies and concern over the U.S. balance of trade deficit. The U.S. Treasury recommenced monthly auctions of 300,000 ounces in May, rising to 750,000 ounces in November and to 1.5 million ounces in December. In

U.S. Dollars per Troy oz.



addition, the IMF continued to sell 470,000 ounces per month. The mar-

ket absorbed these quantities without weakening.

## PHOSPHATES

### WORLD BALANCE — '000 Short Tons P<sub>2</sub>O<sub>5</sub>

Year Ending June 30	1976	1977	1978
Supply	29,925	32,010	33,781
Consumption	27,728	30,354	31,099
Difference	2,197	1,656	2,682

Rising farm commodity prices stimulated agricultural production and fertilizer application. Despite increased availability of phosphates in North America, domestic and export shipments limited inventory build-up and prices in Canada improved during the year by Cdn. \$10 to reach \$165 per ton.

## POTASH

### WORLD BALANCE — '000 Short Tons K<sub>2</sub>O

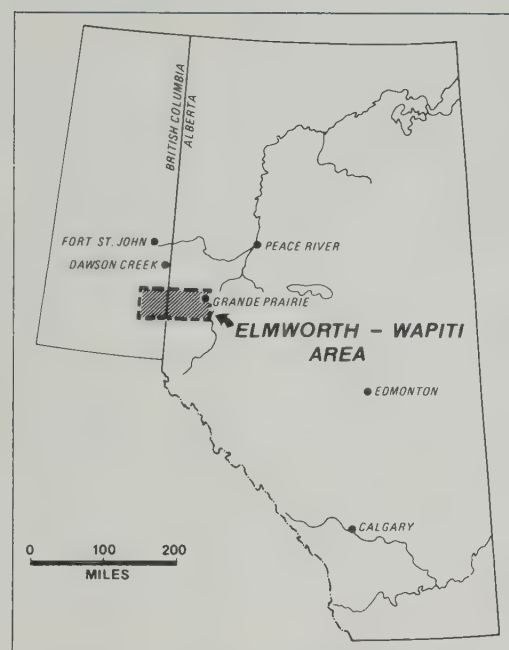
Year Ending June 30	1976	1977	1978
Production	25,408	26,907	28,101
Consumption	23,953	25,408	26,664
Difference	1,455	1,499	1,437

Production of potash in Saskatchewan rose almost 10% to 6.8 million tons K<sub>2</sub>O. Although rail car shortages seriously impeded deliveries, particularly during the peak spring period, shipments to North American and export markets increased in line with production and stocks changed only minimally.

The published price for standard grade strengthened during the year by U.S. 10¢ to 65¢ per K<sub>2</sub>O unit and the effective prices for the premium grades ranged between 75¢ and 79¢. There was some seasonal discounting coincident with off-peak shipping periods.

# Exploration and Development

## Oil and Gas



### CANADIAN HUNTER (75%)

A major farmout arrangement was entered into shortly after mid-year with Esso Resources Canada, a wholly-owned subsidiary of Imperial Oil Limited, involving the Noranda and Agnew Lake Mines Limited interests in the Canadian Hunter venture. Esso may

earn up to 12.5% interest in Hunter holdings in the Elmworth and Wapiti areas of Alberta and up to 17.5% of all other acreage by spending a minimum of \$150 million, mainly for seismic and drilling on the properties, over a 30-month period from August 1, 1978. Esso may spend an additional \$29 million under various option arrangements that do not alter its final interest in the lands. If Esso earns to its maximum limit, Noranda's direct interest will be reduced from 75% to 64.6% in the Elmworth-Wapiti acreage and to 60.4% in other properties and Agnew Lakes' 15% interest will be reduced to 12.9% and 12.1% respectively. In order to maintain its 10% interest earned by the end of 1978, Petromark will be required to meet a normal ongoing share of expenditures plus an additional contribution of up to \$19.9 million during Esso's earning period.

Total 1978 expenditures were as follows (\$ million):

	Land Acquisition and Exploration	Oil and Gas Development	Total
Esso	5.6	21.0	26.6
Noranda	17.0	13.7	30.7
Petromark	13.2	4.7	17.9
Agnew	3.4	2.8	6.2
	39.2	42.2	81.4

Noranda's net investment since 1973 has been \$103 million. Noranda's earnings from production operations in 1978 were \$3.4 million, reducing to a \$4.3 million net loss after deduction of exploration write-offs.

The largest portion of land acquisition and exploratory drilling activity

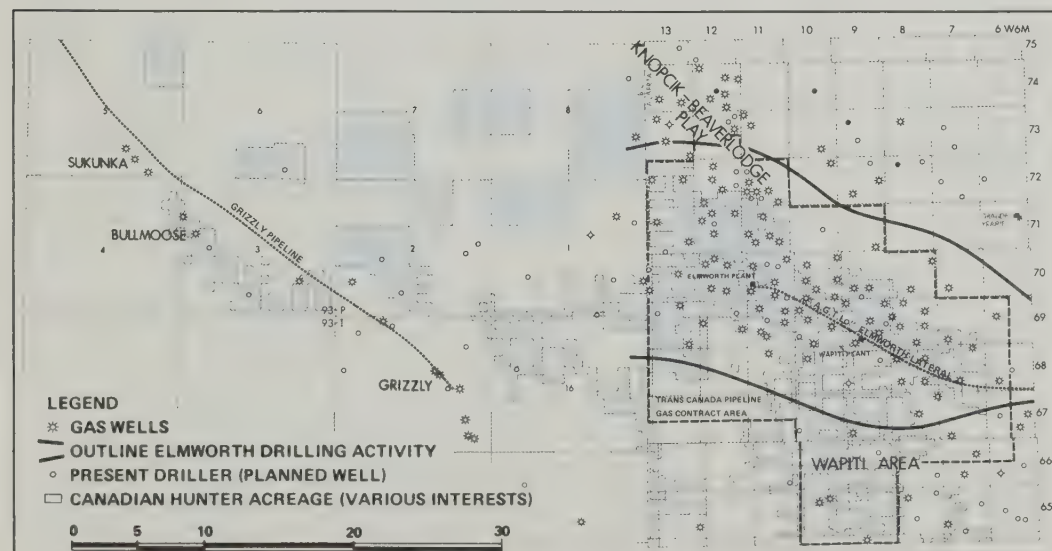
continued to be concentrated in the Elmworth and adjacent Deep Basin areas in Alberta and British Columbia. Hunter now has 49 wells along the main Elmworth-Wapiti productive trend extending about 40 miles eastward from the Alberta-British Columbia border. As well as further defining the continuity of the Cretaceous Falher gas reservoir, this drilling began delineation of a number of other gas productive horizons both above and below the Falher; these additional zones are expected to contribute significantly to the ultimate reserves established in this area. In the Gold Creek-Karr area about 50 miles south-east of Elmworth, a Cretaceous Gething wet gas accumulation is now in the initial development phase, and gas sales could commence as early as 1980-1981, dependent on export approval.

At Elmworth-Wapiti, gas sales to TransCanada PipeLines for the domestic market are scheduled to commence on November 1, 1979 with an initial 30 million cubic feet per day average contract quantity in each of the Elmworth and Wapiti field sectors. (Noranda share — 25 million cubic feet per day.) Excellent production rates have been established on Falher gas wells completed to date and only 6 to 7 wells will be needed in each contract sector to meet this initial volume requirement. Gathering system construction is completed at Elmworth and in progress at Wapiti. The Elmworth liquids recovery plant and similar facilities at Wapiti will be completed by the autumn of 1979.

Additional gas wells were drilled and put on production at Keg River in northern Alberta and at Kobes-Townsend, Dahl and Julienne in British Columbia. Development drilling continued on heavy oil properties in the Lloydminster area.

Canadian Hunter participated in the drilling of 157 exploration and development wells resulting in 54 oil and 74 gas producers, a success ratio of 82%.

Net land holdings at December 31, 1978 were 1.8 million net acres, additions during the year being offset



by reductions resulting from lease selections out of reservation lands.

Noranda's 75% share of oil and gas liquids production averaged 943 barrels per day (747 net of royalties). Noranda's average daily gas production was 10.8 million cubic feet per day (9.4 million net of royalties).

Noranda's share of oil and gas reserves at year-end, after allowance for maximum share to be earned by Esso, follow:

#### OIL & NATURAL GAS LIQUIDS

(Millions of Barrels)	Proven	Probable	Total
Gross	4.0	5.0	9.0
Net of Royalty Interests	2.8	3.8	6.6

#### GAS (Billions of Cubic Feet)

Gross	288.4	231.6	520.0
Net of Royalty Interests	209.1	156.2	365.3

#### PANARCTIC OILS (4.19%)

Noranda's expenditures were \$1.0 million, increasing the cumulative investment to \$10.1 million. Noranda did not participate in the June 1978 financing subscription thereby reducing its overall interest from 4.49% to 4.19%.

The only success from 10 exploration wells drilled in the Arctic Islands in 1978 was at Roche Point 0-43, located off-shore from Sabine Peninsula, Melville Island. Panarctic owns 11 percent of this well which flowed 20 million cubic feet of gas per day on initial test.

## Minerals

During 1978 \$13.9 million was spent on exploration and development. Of this total, 48% was spent in Canada, 33% in the U.S.A., 11% in other countries and 8% on ocean mining research. An additional \$6.1 million was contributed by joint venture partners to projects managed by Noranda.

Exploration for base metals continued in Newfoundland, Quebec, Ontario, British Columbia and the Northwest Territories with major programs in the Matagami and Noranda areas of Northwestern Quebec. A 75% interest in a lead showing in the Sops

Arm area of Newfoundland was acquired and drilling continues. Exploration for uranium took place throughout Canada with the emphasis in Saskatchewan and the Northwest Territories. Participation in joint ventures with the Saskatchewan Mineral Development Corporation and Gulf Minerals in one project and the Central Electricity Generating Board Exploration (Canada) Limited, a British utility, in another project has produced encouraging results in each case.

In the U.S.A. general reconnaissance exploration continued in the west, the southeast and Alaska. Efforts were concentrated on the search for molybdenum, uranium and lead/zinc mineralization. An exploration adit was started on the Greens Creek property in Alaska, a joint venture in which Noranda has approximately a 30% interest. However, work has been hampered by continuing uncertainty as to whether or not this property will be declared within a wilderness area or a National Monument. Considerable time and effort has been devoted to ensuring that the government and public are aware of the problems and economics involved. A feasibility study on the Blackbird cobalt property in Idaho is scheduled for completion late in 1979. Extensive uranium exploration in the west has been carried out in conjunction with E & B Exploration Limited.

In Chile the engineering and metallurgical studies on the Andacollo project were completed and our Chilean partner acquired the property under existing option agreements. Evaluation of this prospect continues.

In Ireland, studies on the Balinalack prospect held by Syngenore Exploration Limited were updated and further studies will continue in 1979. Several prospecting permits were surrendered and efforts are being concentrated on the most promising areas.

In Australia, environmental and engineering programs were continued on the Koongarra uranium deposit and the draft Environmental Impact Statement was filed.

Participation continued in a consortium led by Kennecott Copper Cor-

poration which is studying methods of mining manganese nodules containing nickel, copper, cobalt and molybdenum from the ocean floors.

## Other properties

### NORTHWEST QUEBEC

MINERAL INVENTORY	Tons (000)	Grade			
		% Cu	% Zn	Au o.p.t.	Ag o.p.t.
Chadbourne	1,100	—	—	0.11	—
Magusi	1,520	1.0	4.8	0.04	1.0
New Insko	790	2.7	—	—	—
Les Mines Gallen (West Macdonald)	2,758	0.15	4.5	0.03	0.7

Re-examination of the Chadbourne property, encouraged by higher prices for gold, resulted in a decision to develop the mine for production at a rate of 20,000 tons of ore per month commencing in mid-1979. At year end, higher prices for zinc prompted resumption of engineering studies for Les Mines Gallen. Water treatment pilot plant tests were completed and the advantages of underground versus open pit mining are being considered. No work was done on the New Insko and Magusi properties.

### NORANDA PHOSPHATE

The joint venture Pine Level Project by Noranda (51%) and New Jersey Zinc maintained holdings of 8,200 acres in DeSoto County, Florida with drill indicated reserves of 35 million tons of recoverable phosphate rock. This property will be brought to production to supply market demand when prices for the product strengthen.

### GOLDSTREAM DIVISION

Environmental studies to obtain water use permits to develop a power supply for this copper-zinc property, some 58 miles north of Revelstoke, B.C. are continuing. Indicated mineral inventory is 4,000,000 tons averaging 3.6% copper and 2.6% zinc.

### NEW MEXICO POTASH

Some 21,000 acres in Lea County, New Mexico with a mineral inventory of 110 million tons averaging about 15% K<sub>2</sub>O equivalent, are being maintained.

# Research

Success in research and development, like mineral exploration, is not assured. One ingredient that reduces the risk of these pursuits is the full participation of people with skills in research, operations and sales.

This fruitful cooperation is showing promise in searching for new markets for zinc to replace those lost in the automotive industry due to the emphasis on lighter automobiles. Metallurgists from the Research Centre and Noranda Sales' personnel have introduced a series of high-strength zinc foundry alloys for gravity casting through a major U.S. alloyer. This group is working with end-users to find new applications for Noranda's alloys.

Five years ago, the costs of alloying additions and low productivity from

an old plant made Norcast Ltd. (formerly Quebec Iron Foundries), uncompetitive in producing grinding slugs for the mining industry. A modern plant with mechanized casting equipment was built which, together with a program to develop a better and less costly alloy, led to the introduction of "Marmet" grinding slugs; a successful and profitable collaboration between researchers and producers.

Noranda's metallurgical operations require electrowinning or electrorefining of metals and we are fortunate in having a highly innovative group of electrochemists at the Research Centre. The involvement of these people with Canadian Electrolytic Zinc has contributed to improved plant operation and a considerable saving in chemical reagents. The same group has developed a novel stable anode for electrowinning which is being tested commercially.

The joint research program of Noranda and Electrolyser Corporation has led to better efficiency in hydrogen

electrolysis cells. This improvement was sufficient to win a substantial order from a European customer for medium sized cells.

At the year end, 143 people, of whom 58 are professionals, were employed at the Centre. Total spending was \$4,330,000.

## Environmental Control

Promising results have been achieved on special noise abatement projects at a number of the operating locations.

The proposed water effluent control program covering the operating and inactive mining sites in the vicinity of Noranda, Quebec was approved in principle by the regulatory agency. Work completed includes pilot testing of effluents, diversions of streams and geophysical studies related to recycling.

Several environmental research projects are underway at operating plants and the Noranda Research Centre with participation of representatives from various Federal Government Departments. These projects include cyanide destruction testing at Pamour, electrostatic dust studies with pilot testing at the Horne smelter towards improving the efficiencies of the precipitators and biological oxidation of thiosalts in mill effluents at Brunswick Mining. The Research Centre's staff is working closely with the operating personnel at the Horne smelter and Brunswick Mining.

Preoperational background data is being collected at a property on Admiralty Island, Alaska. An environmental study was conducted on an inactive mine in Idaho, U.S.A. as part of a feasibility analysis relative to reopening.

Since 1971, capital expenditures for emission and effluent control, including acid plants exceed \$127 million.



"Marmet" grinding slugs exiting from stress relieving furnace and on way to storage.

# Mining and Metallurgy

Progressively higher prices for base metals and precious metals through the year, the lower exchange value of the Canadian dollar and stronger demand for zinc resulted in increasing profit to a more reasonable level for the

mining and metallurgical operations compared to 1977. The efficiencies effected in the past two years have been maintained, and capital expenditures on existing facilities restricted to those necessary for the continuity of operations.

At the Geco mine the grade of ore treated was below plan because mining of higher grade pillars was restricted, in order to maintain good mining operations. The Gaspé operation again had a significant net loss in part due to the strike in the last quarter. Higher molybdenum prices provided increased earnings for Brenda, despite a lower grade of ore being treated. Production at the Mattagami mine decreased as scheduled because of diminishing reserves and a higher proportion of pillar mining. The lower zinc price in the first half of the year caused a planned reduction in tonnage treated by Orchan, however underground exploratory diamond drilling at its Norita mine was successful in discovering a new higher grade copper-zinc ore zone, which was further delineated during the year.

Higher lead and silver prices restored profitable operations to Brunswick Mining and Smelting giving cause for resumption of the expansion program to increase production to 11,000 tons per day. Modification to the mining plant, as well as labour difficulties prevented Tara Mines from reaching rated capacity.

Difficulties in the leaching process continued at the Agnew Lake uranium mine and production was limited to 400,000 pounds of  $U_3O_8$ . Pamour gold output was at near record levels and, with the increase in the gold price, net profits were at an all-time high. Due to declining reserves, Kerr Addison mine production was decreased substantially compared to the previous year.

At year end, Noranda purchased from CF Industries their 49% interest in Central Canada Potash, making C.C.P. a wholly-owned subsidiary. In spite of efficient operations and good markets, high taxes resulted in a net loss for the year.

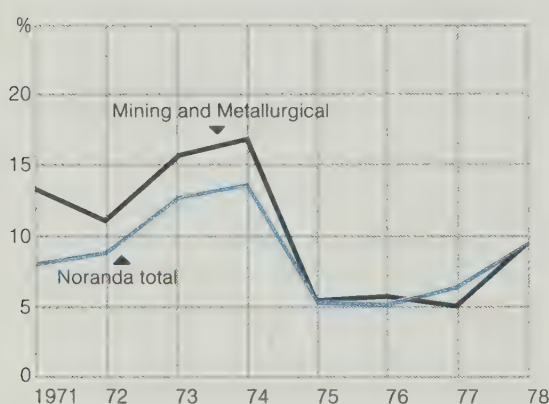
In October the Bell Copper Division was sold to Granby Mining Corporation, subject to approval of the Foreign Investment Review Agency. Approval had not been granted at year end.

On December 31, 1978, Orchan was amalgamated with Noranda Mines Limited. In December shareholders of Noranda and Mattagami approved a proposal to merge.

The copper smelters operated at less than capacity, at the Horne because of shortages of concentrates, and at Gaspé because of the strike. This in turn limited anode feed to Canadian Copper Refiners, where production was slightly ahead of the previous year.

Canadian Electrolytic Zinc operated at 78% of capacity with production being increased in the latter part of the year due to improvement in demand. The excess inventories of zinc concentrate and metal at the beginning of the year were eliminated. The Brunswick smelter achieved another record year in production of refined lead and silver.

Return on net assets



## NORANDA — INTERESTS

### Summary of Canadian Mine Production

	Ore Treated (000 tons)	PRODUCT					
		Copper (tons)	Zinc (tons)	Lead (tons)	Silver (000 oz.)	Gold (ounces)	Molybdenum (000 lbs.)
Noranda*	16,465	88,873	48,720	624	1,487	23,000	5,829
Brenda	11,018	15,550					7,300
Brunswick	3,371	3,600	232,000	79,000	5,063		
Central Canada Potash	3,479						1,301
Kerr	256					83,200	
Mattagami Lake**	1,929	10,450	122,800	3,370	2,039		
Pamour Porcupine	2,000	1,877			71,532	161,372	
Placer***	19,510	44,907					14,020

\*Geco, Boss Mountain, Bell Copper, Gaspé, Orchan, \*\*Mattagami, Mattabi,

\*\*\*Endako, Craigmont, Gibraltar

### Summary of Smelting and Refining Production

	PRODUCT					
	Copper (tons)	Zinc (tons)	Lead (tons)	Silver (000 oz.)	Gold (ounces)	Cadmium (pounds)
Horne Smelter	226,000					
Gaspé Smelter	55,900					
Canadian Copper Refiners	388,000			22,600	455,000	
Canadian Electrolytic Zinc		176,200				866,600
Brunswick — Smelter			66,900	3,668		

# Operations

## Abbreviations used —

<b>Cu</b>	copper
<b>Zn</b>	zinc
<b>Pb</b>	lead
<b>Ni</b>	nickel
<b>Ag</b>	silver
<b>Au</b>	gold
<b>Mo</b>	molybdenum
<b>Hg</b>	mercury
<b>K<sub>2</sub>O</b>	potassium oxide
<b>U<sub>3</sub>O<sub>8</sub></b>	Uranium oxide
<b>o.p.t.</b>	ounces per ton

## HORNE DIVISION SMELTING

PRODUCTION			
	Material Smelted (Excludes Flux)		Cu Content of Anodes Produced
	Noranda (Tons 000)	Custom (Tons 000)	(Tons 000)
1978	161	735	226
1977	182	798	243
1976	176	799	229
1975	287	735	231
1974	341	839	269

The smelter operated below capacity. Operations were curtailed on a regular basis to control ambient levels of sulphur dioxide.

The Noranda Process Reactor had increased throughput and improved metal recoveries. Employees in this section recorded a second complete year without a lost time accident.

An ambitious six year program to rehabilitate areas affected by tailings disposal was initiated. Good progress has been made with revegetation, diversion of waterways and piloting of effluent treatment methods.

One of two electrostatic precipitators on the reverberatory furnace flue gas system was overhauled and dust collecting efficiency improved by 60 per cent.

As a result of inter-union rivalry, the division has operated without a collective agreement since March, 1978.

## GECO DIVISION

ORE TREATED			
Tons (000)	Grade		
	% Cu	% Zn	Ag o.p.t.
1,733	1.54	2.19	1.13

CONCENTRATES PRODUCED			
Metal Content			
Cu Tons	Zn Tons	Pb Tons	Ag. Oz.
24,500	28,200	624	1,383,200

MINERAL INVENTORY			
Tons (000)	Grade		
	% Cu	% Zn	Ag o.p.t.
23,883	1.87	3.78	1.54

Production of ore and of metals in concentrates was lower than in 1977 due to continuing bulk mining in lower grade sections of the mine. Scheduled development of higher grade pillars and remnants was continued. Productivity measured in tons of ore produced per manshift worked was maintained.

The modular training system directly involved 47% of the underground work force and had a positive influence in reducing employee turnover and substantially improving safety performance.

Capital expenditures were directed to replacing and supplementing mining and ore transportation equipment.

## BOSS MOUNTAIN DIVISION

ORE TREATED		
	Tons	Grade % Mo
	597,400	0.152

METAL CONTAINED IN CONCENTRATE PRODUCED	
	lbs Mo
	1,660,600

MINERAL INVENTORY		
	Tons	Grade % Mo
	2,700,000	0.18

Extraction of the original proven ore reserves was completed. However, improved prices for molybdenum concentrate encouraged the development of additional drill indicated sources of ore. A small open pit was in production by mid-year and will provide most of the mill feed until 1980, supplemented with current development material from new underground sources.

Grade of the pit material is lower than anticipated, but with continuing strong markets, production should be extended for another 4 years.

## MINES GASPÉ

MINING		
ORE TREATED	Tons (000)	Grade % Cu
Needle Mountain	969	1.21
Copper Mountain	7,833	0.42

MINERAL INVENTORY		
	Tons (000)	Grade % Cu
Needle Mountain		
Proven ore	6,800	1.20
Probable ore	4,418	1.26
Copper Mountain		
Sulphide—Proven	107,370	.40
Probable	66,468	.33
Oxide—Proven	25,194	.44
Probable	4,751	.40

## SMELTING

	Concentrates		Production	
	Gaspé (Tons)	Custom (Tons)	Cu (Tons)	Acid (Tons)
1978	178,000	65,000	55,900	134,000
1977	235,000	93,000	75,800	168,800
1976	231,900	91,800	73,600	192,900
1975	205,300	110,500	73,200	174,900
1974	190,500	90,300	69,700	154,700

Production was halted on October 16 by a labour strike which continued into 1979.

Underground extraction from Needle Mountain was limited by inadequate supply of compressed air but the grade of ore mined was higher than in 1977. Mineral inventory was augmented by successful drilling of the "C" northwest zone, but 700,000 tons of non-economic "A" zone material were deleted.

Enlargement of the Copper Mountain open pit resulted in a lower grade of ore mined and an increase in the waste to ore stripping ratio. Consequently recovery of molybdenite was adversely affected and production was limited to 2,084 tons of concentrate compared to 2,224 tons in 1977.

Smelter production was lower due to shortage of both custom and Gaspé concentrates. The oxide copper leaching plant remained idle pending completion of research to improve control of effluents.

**ORCHAN DIVISION****ORES TREATED**

Tons	Grade	
	% Zn	% Cu
406,310	5.89	0.61

**METALS CONTAINED IN  
CONCENTRATES PRODUCED**

Zn tons	Cu tons	Ag ozs.
20,520	1,750	104,475

**MINERAL INVENTORY**

	Tons (000)	Grade		Ag o.p.t.
		% Zn	% Cu	
Orchan — Proven	328	6.1	0.7	0.7
Norita — Proven	350	5.1	1.2	0.7
Norita — Drill indicated	3,084	4.5	1.9	0.8
Radiore No. 2 "	153	1.0	2.0	0.2
P.D. Division "	1,545	4.5	0.9	0.9

With weak metal markets prevailing early in the year, production cuts were made to avoid excessive inventory build-up. As exploration drilling from the lower levels of the Norita mine produced encouraging results, the development program was accelerated and at year end some 2.1 million tons of ore averaging 4.1% zinc, 2.7% copper and 0.9 oz. of silver per ton had been indicated in the new "A" zone. Ore treated in the concentrator included 278,000 tons from the Norita mine and 14,000 tons from "A" zone development.

The Noranda proposal to amalgamate with Orchan, on the basis of 1 share of Noranda for 6 of Orchan, was confirmed by shareholders and became effective December 31st.

**BELL COPPER DIVISION****ORE TREATED**

Tons	Grade	
	% Cu	Au o.p.t.
4,927,000	0.43	0.01

**CONCENTRATES PRODUCED**

Tons	Metal Content	
	Cu Tons	Au Oz
68,000	18,000	23,000

**MINERAL INVENTORY**

Tons	Grade	
	% Cu	Au o.p.t.
21,193,000	0.49	0.01

Modifications were completed to the grinding and tailings circuits to increase the milling rate, but the extra capacity was not utilized as mine pro-

duction was below plan due to maintenance difficulty with haulage trucks. Operating costs were 16% higher and capital expenditures were limited to essential production items. Labour turnover remained high and safety performance, though good, was at a higher compensable frequency rate than in 1977. A two-year labour agreement was ratified in March.

The assets of this Division and the Morrison Lake copper property were sold to Granby Mining Corporation on October 4, 1978, subject to approval by the Foreign Investment Review Agency. Approval had not been received at year end. The base sale price is \$22 million, plus the value of stores inventory, assumption of housing mortgages and working capital freed. The concentrate will be treated at the Horne smelter under a 10-year agreement and Noranda will act as contractor to expand the concentrator to 17,000 tons per day. An expanded Bell pit is estimated to have a mineral inventory of 50 million tons, grading 0.52% copper and 0.011 ounces of gold per ton at a 0.35% cutoff grade for copper and the Morrison property at a 0.30% copper cutoff is 61 million tons averaging 0.41% copper.

**CANADIAN COPPER REFINERS****REFINED METAL PRODUCTION**

	Copper (tons)	Silver (oz)	Gold (oz)
1978	388,000	22,600,000	455,000
1977	383,000	21,986,000	372,000
1976	387,000	22,501,000	336,000
1975	395,000	19,835,000	346,000
1974	427,000	19,413,000	352,000

The new shaft furnace to remelt copper anodes was started up in May. Built at a cost of \$2,000,000, this furnace improves productivity and uses fuel more efficiently; conserving about 1,000,000 gallons of oil a year.

The long term program of structural rehabilitation started in 1977 was advanced by the replacement of 200,000 sq. ft. of roof at a cost of \$2,500,000.

As part of our on-going program to improve physical working conditions within the plant \$600,000 was spent in

1978 on lighting and new ventilation equipment. To further reduce emissions of dust to the community around the plant, a start was made on the installation of improved atmospheric emission control equipment. The new air pollution control regulations of the Montreal Urban Community which are now among the most stringent in North America will require additional spending on emission control in 1979.

A contract to refine the copper production of Hudson Bay Mining and Smelting Co. for a further five years was negotiated. Copper from this source constitutes about 15% of metal receipts.

**CANADIAN ELECTROLYTIC ZINC**

(38.5% Direct; 26.4% Indirect at Dec. 31, 1978)

PRODUCTION	Zinc tons	Cadmium lbs.
1978	176,200	866,600
1977	155,550	928,200
1976	125,800	380,000
1975	117,700	401,000
1974	134,800	598,000

The plant was shut down for four weeks in July and, on average for the year, operated at about 78 percent of capacity. Metal shipments increased during the latter part of the year and stocks were reduced to normal levels.

Hydro-Quebec has published a revised schedule of tariffs effective January 1, 1979 which will result in a rapid escalation of electric power costs at least until 1981.

Detailed engineering work was started on auxiliary roaster gas cleaning facilities in order to increase the ability to treat zinc concentrate containing a wider range of impurities.

**ALBERTA SULPHATE**

PRODUCTION	Tons
— Sodium Sulphate	48,200
RESERVES	
— Salts	2,500,000
— Recoverable Product	1,200,000

Product prices remained firm. Dredge mining did not meet expectations, however, production and sales were at higher levels than in 1977. The operation was again not profitable but the

experience gained with dredge mining over the past 2 years should lead to improved control and a better result.

**BELLEDUNE FERTILIZER**

Shipments of diammonium phosphate fertilizer to North American customers were at the same level as last year and a modest improvement in selling price helped to compensate for increased raw material and energy costs. Successful bids on several export orders raised the total shipments from the plant to about 150,000 tons which improved earnings. More sulphuric acid from the adjacent smelter will allow for increased production in 1979.

**BRENDA MINES  
(50.9%)**

CONSOLIDATED EARNINGS		
	1978	1977
	\$13,428,000	\$9,480,000
ORE TREATED		
	Grade	
Tons	% Cu	% Mo
11,018,000	0.165	0.040
CONCENTRATES PRODUCED		
	Metal Content	
Total Tons	Cu Tons	Mo Tons
58,000	15,550	3,650
MINERAL INVENTORY		
	Grade	
Tons	% Cu	% Mo
97,659,000	0.165	0.040

An all time high of 19,268,000 tons of waste rock and ore were removed from the open pit. The ore grade was lower than expected due to a temporary pit slope stability problem which is now corrected.

The tonnage of ore milled, at an average rate of 30,187 tons per day, was on target. Concentrate grades were satisfactory, but the lower grade of ore resulted in a lower output of metals. Concentrates were sold as produced to traditional overseas buyers.

Exploration in British Columbia involves work in the vicinity of the mine and in two joint venture programs.

An additional \$7.2 million was invested in Dome Petroleum's Beaufort

Sea oil and gas drilling program to earn a small net profits interest in the next 10 wells in the program. A commitment was made to spend \$6.0 million over 15 months in a joint oil and gas exploration program with Sulpetro Limited at a number of locations in Alberta. This program is being shared 66-2/3% by Brenda and 33-1/3% by Mattagami Lake Mines Limited. In a separate transaction, 50% of Sulpetro's interest in 15 wells and 5,000 net acres of development land with estimated gas reserves exceeding 7 billion cubic feet was acquired for \$1.2 million.

Earnings improved due to higher molybdenum prices and the continuing favorable effect of the U.S. dollar exchange. Dividends paid, including a year-end extra, totalled \$1.06 per share.

**CENTRAL CANADA POTASH**

		Grade
		Tons (000)
ORE TREATED	3,479	26.4% K <sub>2</sub> O
MURIATE PRODUCED	1,301	
RESERVES	571,500	27.0% K <sub>2</sub> O

Production was 10% below the record levels of 1977 because major maintenance was required on the large continuous mining machines. Also a shortage of rail cars limited shipments to 1,321,400 tons. Thus, the product inventory was reduced by only 10% to 174,200 tons; all premium grade coarse and granular muriate.

In October, the Supreme Court of Canada reversed the 1977 decision of the Saskatchewan Appeal Court and restored the 1975 ruling of the Court of Queen's Bench that the Province's potash prorationing scheme was ultra vires, beyond the competence of the Saskatchewan Legislature, invalid and unconstitutional. However, the appeal for damages due to loss of production and sales in the years 1972 through 1975 by intimidation and threatened cancellation of the mineral lease was not allowed, because the threat was judged not to be an unlawful act.

There is not yet any clear indication that meaningful relief will be obtained from the excessive resource

tax policy of the Government of Saskatchewan. Profit before taxes of \$24 million was reduced by the provisions for federal and provincial taxes to a net loss of \$6 million.

**BRUNSWICK MINING AND SMELTING  
(64.1%)**

EARNINGS					
		1978	1977		
		\$25,616,000	\$2,395,000		
MINING					
		Tons	Grade		
Ore mined		3,371,000	12.45% Pb + Zn.		
CONCENTRATE PRODUCED					
Metal Content					
Zn Tons	Cu Tons	Pb Tons	Ag Oz		
232,000	3,600	79,000	5,063,000		
MINERAL INVENTORY					
	Tons (000)	% Zn	% Pb	% Cu	Oz. Ag/ton
ZN/PB					
No. 12 Mine:					
Proven	71,549	9.13	3.68	0.29	2.79
Probable	36,985	9.32	3.95	0.35	2.88
No. 6 Mine:					
Proven	632	7.25	2.64	0.27	2.48
COPPER					
No. 12 Mine:					
Proven	9,474	1.13	0.40	1.11	0.85
Probable	4,620	1.57	0.54	1.12	1.39

The mine produced more zinc, lead and silver than in 1977, despite a reduction in manpower. Earnings improved dramatically mainly as a result of higher prices and a favourable exchange rate. Work on the expansion project resumed as the financial position improved. Capital expenditures on the expansion to date are \$42.5 million.

SMELTING			
Production	Pb Tons	Ag Ozs.	Sulphuric Acid - Tons
1978	66,900	3,668,000	185,000
1977	56,400	3,458,000	152,100
1976	51,400	3,004,000	119,300
1975	50,900	2,195,000	139,700
1974	44,200	2,085,000	117,000

Refined lead production increased by 19% over the previous year due to higher grade concentrate and improved operations. A 20 tons-per-day oxygen plant was built and put in full operation in January, 1979.

Hygiene and safety were good with an accident frequency rate of 3.8 per million manhours worked.

**LANGMUIR PROPERTY (51%)**

	Tons	Grade % Ni
ORE TREATED	65,427	1.39

METAL CONTAINED IN  
CONCENTRATE PRODUCED 702 tons of Ni

With continuing weak market conditions for nickel, production was terminated in March. Exploration drilling to test the potential of the accessible underground zones extended the proven, probable and possible mineral inventory in the three known zones to 540,000 tons averaging 1.3% nickel. The value of that material under the circumstances prevailing will not justify maintenance of the mine on a standby basis. Therefore, the mine was cleared of salvageable equipment and allowed to flood.

**MATTAGAMI LAKE MINES**

(34.1% Direct; 8.5% Indirect at Dec. 31)

ORE TREATED	Grade				
	Tons	% Zn	% Cu	Ag o.p.t.	Au o.p.t.
	968,000	7.6	0.52	0.95	0.015

CONCENTRATES PRODUCED			Metal Content	
Total Tons	Zn Tons	Cu Tons		
143,000	67,800	3,600		

MINERAL INVENTORY					Grade	
Tons	% Zn	% Cu	Ag o.p.t.	Au o.p.t.		
7,625,000	7.3	0.60	0.90	0.015		

Mining continued as planned and the surface crown pillar was completely removed during the fourth quarter. All future ore will be mined from underground stopes. Development for the deep exploration project continued and diamond drilling of target areas will commence early in 1979. Production of zinc concentrate was 99.5% of plan and copper concentrate 97%. Zinc recovery at 92.7% was the highest ever attained.

The average number of employees was reduced and turnover remained steady. Regrettably the number of compensable injuries was six during the year compared with only two in 1977. Good safety practice continues to be emphasized and up-dated. The collective agreement comes up for renewal in June 1979.

**Lyon Lake Division**

This property remained on a care and maintenance basis throughout the year. However, mineral inventory was re-evaluated and resumption of development is planned for early 1979.

MINERAL INVENTORY						Grade	
Tons	% Zn	% Cu	% Pb	Ag o.p.t.	Au o.p.t.		
3,945,000	6.53	1.24	0.63	3.42	0.01		

**F. Group**

This small orebody located two and one-half miles west of the Mattabi mine is scheduled to be brought into production in 1981.

MINERAL INVENTORY					Grade	
Tons	% Zn	% Cu	% Pb	Ag o.p.t.		
630,000	8.10	0.98	0.49	1.80		

Mattagami is participating for a 33⅓ percent share in an oil and gas exploration program with Brenda Mines Ltd. Brenda is committed to a \$6.0 million outlay for a joint program over 15 months with Sulpetro Limited covering 25 project areas at various locations in Alberta.

**MATTABI MINES**

(60% owned by Mattagami Lake Mines at Dec. 31)

ORE TREATED					Grade	
Tons	% Zn	% Cu	% Pb	Ag o.p.t.		
961,000	6.49	0.83	0.67	2.72		

CONCENTRATES PRODUCED					Metal Content	
Total Tons	Zn Tons	Cu Tons	Pb Tons	Ag Oz.		
139,000	55,000	6,850	3,370	2,039,000		

MINERAL INVENTORY					
		Grade			
	Tons	% Zn	% Cu	% Pb	Ag o.p.t.
Underground and Pit	4,220,000	7.21	0.57	0.74	2.76

Production of copper and zinc concentrates was close to target, while lead and silver production was considerably above. Metallurgical results were excellent.

Significant progress was made on the development of the underground ore, and lenses within the pit walls.

Sub-economic ore totalling 1,100,000 tons, may be mined under more favourable economic conditions.

A low waste to ore stripping ratio contributed to a substantial reduction in operating costs. Unfortunately, there were eleven compensable injuries for 1978 compared to two in 1977. A modular training system was introduced to re-emphasize good safety habits and to improve work practices.

**PAMOUR PORCUPINE MINES (48.8%)**

	1978	1977
EARNINGS	\$5,200,000	\$128,000

MINERAL INVENTORY					Grade		
		Tons (000)	Au o.p.t.	Ag o.p.t.	% Cu		
No. 1 Mine		1,400	0.10				
No. 3 Mine		197	0.20				
Schumacher Div.							
Copper Section		561	0.03	0.08	0.62		
Gold Section		109	0.19				
Ross Mine		246	0.15	0.15	0.12		
Total		2,513	0.10	0.09	0.39		

ORES TREATED					Grade		
		Tons (000)	Au o.p.t.	Ag o.p.t.	% Cu		
No. 1 Mill		1,028	0.095	—	—		
Schumacher Mill		972	0.089	0.118	0.233		
Total		2,000	0.091				

METAL CONTENT OF BULLION AND CONCENTRATE PRODUCED				
Au Ozs.	Ag Ozs.	Cu Tons		
161,372	71,532	1,877		

The total tonnage of ores treated in two mills from six different mine sites was some 3000 tons higher than in 1977. However, the proportion of low grade surface mining was increased and, therefore, the production of gold in bullion and copper in concentrate was lower than in 1977.

As metal prices improved, development was increased to re-establish additional working places and a mineral inventory more appropriately scaled to mill capacity. Exploration of the Romfield and Porcupine Peninsular properties was resumed. Shaft deepening at the Ross Division was continued and underground development of the Falconbridge Hoyle property was started. A substantial tonnage of probable and possible ore should be developed to the proven category

within the next year. There were 1,005 employees at year end.

#### KERR ADDISON MINES LIMITED (41.2% Direct; 2.3% Indirect)

EARNINGS	1978	1977
	\$9,649,000	\$6,186,000

PRODUCTION	Interest	Ore Milled Tons	Metal Content in Concentrates
Kerr Addison	100%	256,200	83,200 Oz. Au
Mogul of Ireland	75%	721,900	36,400 Tons Zn 13,800 Tons Pb

MINERAL INVENTORY	Tons (000)	Grade
Kerr Addison	323	0.37 oz. Au/Ton
Mogul of Ireland	2,818	5.52% Zn 2.86%Pb
Agnew Lake	11,150	0.83 lbs. U <sub>3</sub> O <sub>8</sub> /Ton

Earnings include \$2.2 million in gains on sale of investments compared to a loss of \$0.5 million in special items in 1977.

Production from the 90% owned Agnew Lake mine continues to be disappointing, as 400,000 pounds of U<sub>3</sub>O<sub>8</sub> were produced, only 40% of designed capacity. Production continues to be limited by the qualities of ore under leach, but is expected to gradually increase during 1979 as more stopes become available for leaching.

#### PLACER DEVELOPMENT (31.7% Direct; 1% Indirect)

EARNINGS	1978	1977
	\$20,184,000	\$21,509,000

OPERATIONS	Interest	Production Ore Milled Tons (000)	Metal Content in Concentrate
Endako Mines Div.	100%	11,747	7,010 Tons Mo
Gibraltar Mines	71.9%	5,661	18,000 Tons Cu
Marcopper Mining	39.89%	10,427	59,600 Tons Cu
McDermitt Mine	51%	245	920 Tons Hg

MINERAL INVENTORY	Tons (000)	Grade
Endako Mines Div.	243,000	0.082% Mo
Gibraltar Mine	281,000	0.36% Cu
Marcopper Mining	64,000	0.57% Cu
McDermitt Mine	2,418	9.96 Hg Lbs/ton

Earnings reflect a reduction of \$6,025,000 for two extraordinary items relating to Placer's United States coal properties and Australian cattle grazing properties.

Regular earnings increased due to the decreased exchange value of the Canadian dollar and improved earnings by Marcopper and Mattagami. Molybdenum continued in strong demand and was the most significant contributor to earnings.

Operations at the Gibraltar mine were suspended May 26, due to a labour dispute.

#### CRAIGMONT MINES (19.7% Direct; 14% Indirect) Year Ended October 31

EARNINGS	1978	1977
	\$3,572,000	\$2,359,000

ORE MILLED	Tons	Grade % Cu
	2,102,000	1.38

CONCENTRATE PRODUCED	Tons	Metal Content
	94,200	26,907 Tons Cu

MINERAL INVENTORY	Tons	Grade % Cu
	2,312,000	1.40

It is likely that 60% of the mineral inventory can be extracted at 39% dilution. Operations are expected to cease in the first quarter of 1980.

#### EMPRESA FLUORSPAR (74.6% Direct; 14.6% Indirect)

After a two-year period of decline, markets for fluorspar have improved and shipments by 49%-owned Cia Minera Las Cuevas in Mexico amounted to 246,000 tons, including 87,000 tons of acid grade concentrate, compared to 159,000 tons including 69,000 tons of concentrate in 1977.

Reported on the basis of dividends received from Las Cuevas and reflecting the absence of such dividends in both years, net earnings were U.S. \$132,000 in 1978, compared to a net loss of \$52,000 in 1977.

#### EMPRESA MINERA DE EL SETENTRION (60.5% Direct)

Although the mine in Nicaragua remains extremely vulnerable, it was

not directly affected by guerilla activities in that country in 1978. However, there is a shortage of supplies caused by the unrest and the development program was curtailed. Thus, the new shaft to regain access to higher-grade reserves in the flooded section of the mine has not yet been completed and mining continues to be restricted to lower-grade ore. After treatment of 132,000 tons averaging 0.32 ounces of gold per ton in 1978, proven ore reserves at year end were 94,000 tons of slightly higher grade.

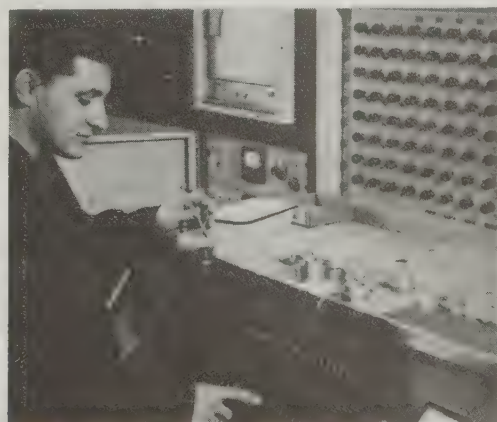
Due to the higher gold price, net earnings were U.S. \$1.8 million compared to U.S. \$1.3 million in 1977.

#### TARA MINES (75% Owned by Tara Exploration and Development)

ORE TREATED	Grade
Tons	% Zn
1,522,400	10.69

CONCENTRATES PRODUCED	Metal Content
Tons	Zn Tons
308,300	146,000

While progress was made during 1978 in increasing production, the designed rate was not reached because of delays due to modifications in mining plans and a five-week industrial dispute involving concentrator personnel during the third quarter. Concentrator performance was satisfactory and recoveries improved, particularly for lead, over 1977 performance levels. Programs undertaken for training, safety and maintenance were increasingly effective.

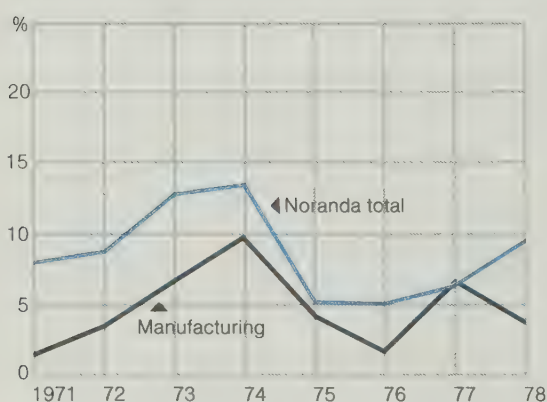


Chief Chemist at Central Canada Potash operates their x-ray analyser.

# Manufacturing

Manufacturing activities had a mixed experience over the year. In Canada the devalued dollar caused a reduction in competing imports and opened previously unattractive export opportunities. Continued general labour harmony in our plants permitted sustained operations, greater production and some improvement in productivity.

Return on net assets



Further rationalization of the management of Noranda's Canadian manufacturing also contributed to better results. Nevertheless, since most of our products are priced on a commodity basis (i.e., their only distinction from the competition is price and delivery), it is clear that even with the commanding market shares they enjoy, the Canadian market alone as presently constituted does not support attractive profitability.

In the aggregate, these activities, which represent net assets of \$582 million produced \$801 million of sales in 1978 compared to \$705 million in 1977. The Canadian plants operated at 76% capacity and hours worked were 358,000 more than in 1977. Of the 33 collective agreements, 17 were renegotiated in settlement of which two chose to strike, resulting in a loss of 49,000 man hours of work.

The year's profit tragedy occurred in the forced closure in February of the Missouri aluminum reduction plant due to power shortages. This in turn was attributed to the coal strike and the professed inability of the power utility serving Noranda Aluminum to stockpile sufficient coal. A claim for this untoward loss of nearly \$17,000,000 is before the courts.

At the end of the year, agreement was reached to acquire an aluminum sheet rolling and foil mill in Huntingdon, Tennessee from RJR Archer Inc. This transaction was closed on January 2, 1979 at a total investment with working capital of \$U.S.40,000,000. It is believed that this acquisition is the final important link in the creation of a fully integrated aluminum enterprise which should enable Noranda to compete effectively throughout the industry.

	Metal Consumption — Tons	
	1978	1977
Canada Wire	71,700	65,400
Noranda Metal	56,000	44,000

	Product Shipped — Tons	
	1978	1977
Nor./Al. + Norandex	156,000	177,000
Grandview	13,000	11,000
Annual prod. Norcast	97,000	37,000
Wire Rope and Bridon	45,000	41,000

## TORONTO GROUP

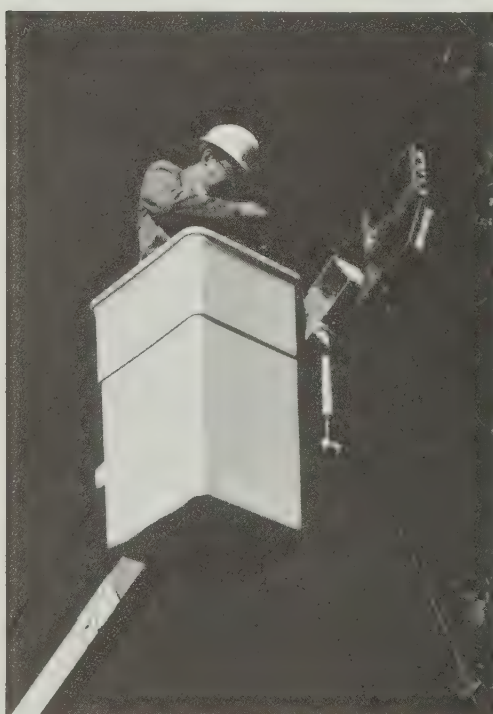
	1978	1977
	(Thousands)	
Sales	\$317,000	\$298,000
Operating Profit (before common costs)	8,600	5,000
Assets Employed	110,000	129,000

Demand for the products of **Canada Wire and Cable** strengthened gradually during the year, but the chronic oversupply to the Canadian market continued to depress prices and curtail margins. For example, there are at least five construction or telephone wire plants in Canada which are not only surplus to the market's needs but owe their existence to some kind of artificial intervention by Government.

As well as specialization and technology, continued rationalization of the industry is essential for its long term health. During the year, Canada Wire took one such step in magnet wire. Its Simcoe plant merged with the magnet wire operations of Universal Wire and Cable Co. of Montreal into a new Company, Canwirco Inc. This new partnership should materially improve Canada Wire's participation in all magnet wire markets.

The improved competitive position resulting from a devalued Canadian dollar permitted the development of important export business while reducing previously disrupting imports. In addition, the improved results of the Company's foreign affiliates were further enhanced by exchange gains. These operations continue to perform generally well relative to the amounts invested except the Iranian one, which investment has been written off.

The Company's fibre optics venture, Canstar Communications, achieved two major goals in 1978. These were the installation of a CATV Supertrunk System for a Broadband Communications Network in London, Ontario and beginning production of a \$2,000,000 order for a fibre optic subsystem for Alberta Government Telephones. Canstar must continually reassess its strategies in a very fast moving field. To this end it profitably divested an interest held for two years in a U.S. fibre optic company and is taking steps



Installing a fibre optic line repeater.

towards long term alliances with communication peripherals suppliers.

**Grandview Industries** made real improvements in its plastic pipe operations which also serve a very over-supplied market. The foam plastic and fiberglass divisions performed satisfactorily as did the affiliated fittings operation, Canplas Ltd.

Overall, Canada Wire operates in a mature industry with little opportunity for improving returns in its traditional business. The Company continues to strive for optimization in existing plants and will look to consolidation and technology based products for its future.

**MONTREAL GROUP**

	1978	1977
	(Thousands)	
Sales	\$230,000	\$176,000
Operating Profit		
(Loss)	3,800	(3,000)
Assets Employed	119,000	125,000

In November, **Noranda Metal Industries** became the owner of the foundry and associated facilities of Norcast (formerly Quebec Iron Foundries) which in future will operate as a division of this Company. Two other such divisions were established in the year — Brass Mills and Special Metals. A major study by consultants is under way to assist in the strategic planning aspects of this restructuring.

The Brass Mills achieved a substantial increase for the year in overall shipments due partly to the advantages offered by the lower value of the Canadian dollar. If the new operating management can bring the productivity in the Fergus strip mill up to par, overall Company performance will be greatly enhanced. The U.S. Forge-Fin copper tube plant had increasing success in heat exchanger and energy conservation markets.

Special Metals Division in Arnprior has a full order book but has experienced persistent technical difficulties. Intense efforts are being made in the area of quality control, and some progress is already evident.

Norcast Division had a record profit year. Although liner and general

casting business was slow, the “Mar-met” alloy for grinding media gained wide acceptance and share of market and a third electric melting furnace is being installed at the Mont Joli plant to meet this new demand. The Cyclomet reclaim plant in New Brunswick enjoyed capacity operations and satisfactory prices.

**Wire Rope Industries** (51.4%) maintained its profitable record and dominant share of market. A major expansion of rope making capability is under way which together with a number of new products should enhance the Company's future competitive position. A new joint venture was established to manufacture wooden cable-reels for the Western operations.

**Bridon American** (49%) improved its position substantially from that of 1977. The Muncy plant was vacated and sold so that all rope making as well as wire drawing is now concentrated at Exeter, Pa., U.S.A. This consolidation has permitted many economies and increased plant efficiencies, placing the Company much more strongly in its market.

**CLEVELAND GROUP**

	1978	1977
	(Thousands)	
Sales	\$254,000	\$231,000
Operating Profits	10,100	31,000
Assets Employed	353,000	260,000
Primary Aluminum		
Production (tons)	109,566	145,664

**Noranda Aluminum** suffered a reduction in earnings of some \$17,000,000 U.S. and 36,000 tons of production due to shut down for lack of power early in the year. When restarted, the plant gradually attained planned levels and operated uneventfully for the balance of the year.

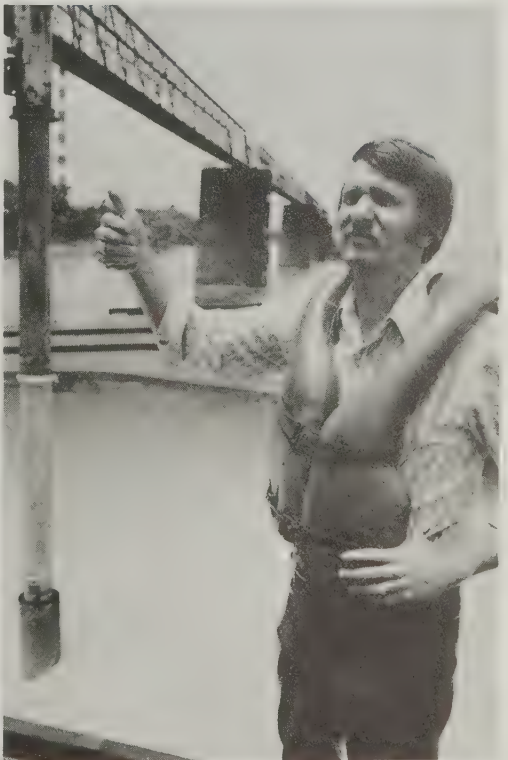
The market for aluminum remained strong throughout 1978 with shipments increasing 9% over 1977. Prices continued to improve notably in fabricated and semi-fabricated pricings which outpaced changes for ingot.

Alumina production at the Friguia plant in the Republic of Guinea returned to normal levels of 600,0000 metric tons. Changes are being made

to that plant to enable production of the more commercially acceptable ‘sandy’ type of alumina, as opposed to the ‘floury’ type now produced.

**Norandex** is a maker and distributor of residential aluminum building products, the largest market segment in the U.S. aluminum industry. The Company is among the top five U.S. aluminum siding suppliers and is focussing on energy saving building products for future growth. These include thermal barrier prime windows, storm windows and doors. Continued growth and improved performance is facilitated by the Company's ownership of 64 distribution centres in the U.S. industrial heartland.

**Norandal USA Inc.** is the name of the aluminum sheet and foil mill in Huntingdon, Tennessee acquired effective January 2, 1979. This plant, based on the most advanced continuous casting process in the business with a capacity of 30,000 tons per year will permit Noranda Aluminum to offer a more complete range of primary aluminum base products. It will also provide a secure source of siding coil for Norandex.



Workman at Noranda Aluminum directing unloading of alumina ore.

# Forest Products

Quite simply, 1978 was the record year for most companies in the forest products industry. Noranda was no exception. Profits last year exceeded any that had been achieved or planned before and are unlikely to be repeated. The principal reason was of course the substantial discount on the Canadian dollar relative to its U.S. counterpart, in which currency most forest products are sold. Exchange gains account for an estimated 43% or \$22.2 million of the earnings from operations.

In addition, there was labour harmony throughout the year and no meaningful production interruptions. The average hourly wage rose by 8% over the year and 34% in the three year period of wage controls which ended on October 14th. Thus it would seem that our production employees were well protected by the controls mechanism and have shared the prosperity of their employers.

The third main element in our profitability was a generally balanced condition in the markets for all our products. The excessive producer inventories of pulp dropped to normal during the year and there was a general improvement in operating rates. The continued high level of U.S. housing starts maintained a strong market

for lumber and related building products. Similarly the demand for coated publication and woodfree papers was excellent. While the outlook suggests some softness in lumber prices, other markets appear to be continuing strongly.

The result of these conditions is fast improving financial positions which had been deteriorating for several years. This in turn should accelerate the renovation and expansion of the Canadian forest product industry.

## PRODUCTION

	Lumber* MM fbm	Market Pulp (000 tons)	Paper Products** (000 tons)
Total	1,572.9	828.4	1,004.9
Noranda's interest	660.3	312.1	398.3

\* includes Northwood Mills for seven months.

\*\* includes Blandin's coated paper.

## FINANCIAL

	1978	1977
100% BASIS	(\$ millions)	
Sales	1,304.3	978.3
Assets Employed	887.7	853.0

## NORANDA'S SHARE\*

Sales	588.5	455.4
Operating Profit	61.7	30.3
Assets Employed	353.0	347.0

\* includes proportionate share of companies not wholly owned.

## NORTHWOOD MILLS

During the third quarter of 1978, this Company's subsidiary, Northwood Properties was sold. Over its 18-year life in the Noranda Group, and counting the proceeds of sale, Northwood Mills realized a 10% return on investment. This was the initial production base of the Company, and although the sale was consummated at a satisfactory profit, it entailed mixed feelings on the part of management. Northwood had assembled the timber limits and built the sawmills but, in the end had to acknowledge that these operations had a more secure future in the hands of an integrated company.

The Building Materials division had an excellent year with good profitability in all branches. Having established a more mature level of operations, this division will seek to establish new outlets in British Columbia and the Maritimes.

The Sales Division also met its targets in its Toronto and London, U.K. offices although the Tokyo operation remained a disappointment. Two ocean going vessels were operated successfully for another year and substantial new business was developed in Italy.

## NORTHWOOD PULP AND TIMBER (50%)

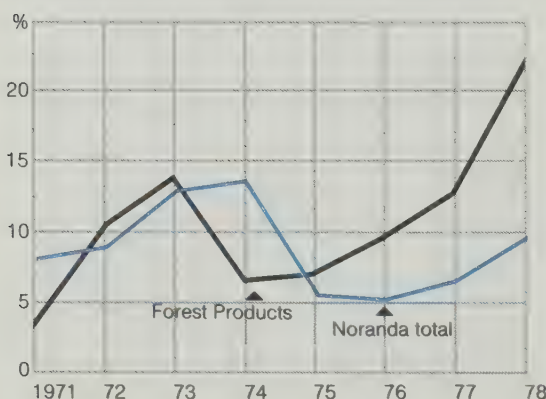
Consolidated earnings exceeded any previous level due principally to the lower Canadian dollar which provided 56% of the total or \$13.0 million. As the pulp market strengthened during the year, so Northwood's pulp mill operating rate increased to average 93% for the year. After due allowance for integrated tonnage, this was about the industry average but most importantly, the rate is probably sustainable for 1979.

Sawmill operations were interrupted only for the rebuild and modernization project at Upper Fraser in late summer. This \$8,000,000 capital expenditure, completed in October provides some increased production and enables the Company to maintain its leadership in sawmill productivity.

Another significant project to reach completion was the Company's new headquarters building in Prince George. This facility is of a unique open design and all wooden construction. It provides, for the first time, a central location for key management personnel.

At Chatham, N.B., progress met plan on the conversion to waferboard capability of the particleboard plant. This \$11,000,000 investment should be operational in April 1979. Surveys indicate that the prospect is for excellent markets at the date of entry.

Return on net assets



## NORTHWOOD MILLS

	Sales		
	Nwd. Mills	Nwd. Building	
	Lumber Mfbm	Lumber Mfbm	Panelboard MSM 1/16"
1978	749,000	262,000	811,000
1977	775,000	245,000	856,000
1976	711,000	284,000	1,039,000
1975	367,000	410,000	1,197,000
1974	660,000	396,000	1,044,000

## FRASER COMPANIES (54.9%)

Fraser recorded historic highs in sales of \$265.1 million, earnings of \$22.6 million and capital expenditures of \$53.6 million. Markets for the Company's groundwood and woodfree papers were uniformly strong and balanced, with prices to match. Some marketing difficulties were experienced in pulp and boxboard products.

Capital projects were again a feature of the Company's progress. A new planer mill was opened at Plaster Rock in March and the Tree Nursery was christened in October. This is Canada's second largest nursery with an ultimate (1980) capability of 14,000,000 seedlings per year.

The Edmundston rebuild continued within budget and close to schedule. Several sections in the digesters and bleachery commenced operations and the recovery boiler with associated peripherals will be operating by spring.

A major expansion project was commenced at the Madawaska paper mill. Estimated to cost some \$42,000,000, it involves the addition of a second off-machine coater and modernization of three paper machines. This will result in additional capacity for lightweight coated groundwood papers. The installation of a billblade coater as part of this program will also increase capacity for specialty coated fine papers.

The Company split its shares 3 for 1 effective December 1 and established a new dividend rate of 20¢ per quarter.

## BRITISH COLUMBIA FOREST PRODUCTS (28.4%)

Earnings of \$69.0 million or \$4.53 per share were the highest this Company has ever recorded. The Company's shares were split 2 for 1 at mid-year and dividends for the year amounted to 60.5¢ per share.

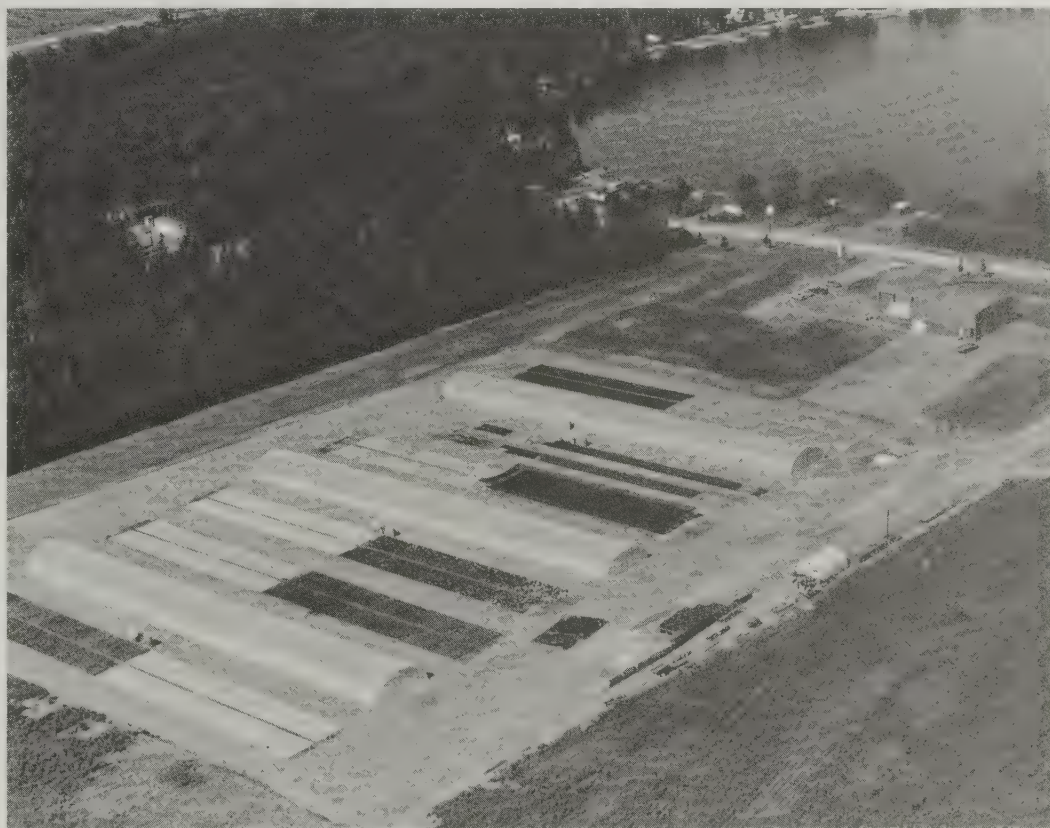
These results arose from first class facilities, well run by excellent production and staff personnel, producing products for balanced markets. In addition and most importantly, the differential of Canadian to U.S. exchange rates provided an estimated \$1.64 per share or 36% of total earnings.

The Blandin acquisition in 1977

further proved itself during the year. This Company's products, coated groundwood publication paper and waferboard, were two of the best performers in the industry in 1978.

The U.S. Justice Department has filed a complaint under the Clayton Act which if successful would result in the whole or partial divestiture of Blandin by B.C.F.P. The Company is vigorously defending this action.

The St. Felicien pulp mill, built and partially financed by B.C.F.P. has had an excellent startup reaching operating rates of 70% and better by year's end. This accomplishment is a great credit to the Company's management team.



Fraser's tree nursery, Edmundston, N.B.

## NORTHWOOD PULP & TIMBER

	Production		
	Lumber Mfbm	Pulp Tons	Chips B.D.U.
1978	548,000	241,000	318,000
1977	554,000	205,000	332,000
1976	512,000	231,000	334,000
1975	235,000	169,000	156,000
1974	447,000	208,000	282,000

## FRASER COMPANIES

	Production			
	Lumber Mfbm	Pulp Tons	Paper Tons	Boxboard Tons
1978	90,200	93,400	395,400	30,500
1977	67,700	83,000	385,100	31,500
1976	64,700	74,100	375,800	32,600
1975	42,900	53,700	301,000	30,300
1974	51,600	97,800	372,400	32,600

## BRITISH COLUMBIA FOREST PRODUCTS

	Production				Blandin	
	Lumber MMfbm	Pulp (000) Tons	News- print (000) Tons	Plywood MMSM 1/16"	Paper (000) Tons	Wafer- board (000) Tons
1978	835	494	279	1,279	300	53
1977	812	421	257	1,203	102	20
1976	721	480	252	1,141	—	—
1975	434	356	193	802	—	—
1974	474	466	246	986	—	—

# Effects of Inflation

As has been pointed out many times, the erosion of corporate financial strength due to inflation is very real, but the measurement of that erosion is difficult. Numerous studies by accounting and other organizations around the world have yet to produce a generally accepted method of measuring inflation's true financial impact on corporations. A committee appointed by the Ontario government to study the problem recommended in 1977 an approach that attempts to measure the effects of inflation on the funds generated by a business. This approach indicates the amount hypothetically available, from the year's operations, for distribution to shareholders or expansion after allowing for inflation in calculating the funds required to maintain the business — that is, after allowing for the higher cost of replacing inventories and fixed assets.

Following the example provided last year, application of this method to Noranda's 1978 results, using a Statistics Canada business index, produces the statement shown on the right.

This statement suggests that of the \$218 million generated in 1978, \$177 million (\$82 million plus \$95 million) should have been spent to maintain the business, given the level of inflation Canada has been experiencing, of which \$39 million could be borrowed. This would have left \$80 million to distribute to shareholders or to spend on growth, assuming no change in the existing debt-equity ratio.

What in fact happened in 1978 was the spending of some \$90 million (net) to maintain the business, \$37 mil-

Funds generated from operations (total from statement of changes in financial position)		\$218,000,000
From this, deduct the funds required to finance original cost of productive assets (historical cost depreciation)		<u>82,000,000</u>
Leaves: amount available, on an historical accounting basis, for distribution to shareholders or for expansion		136,000,000
But to take account of the increased cost of maintaining operating capacity in our inflationary environment the following allocations of funds should also be deducted:		
To replace inventories at higher prices	30,000,000	
For plant, machinery and equipment at higher prices	<u>65,000,000</u>	
	95,000,000	
Less additional funds which may be available from borrowings if present debt-equity ratio is maintained	<u>39,000,000</u>	<u>56,000,000</u>
Leaves: funds hypothetically available from the year's operations for distribution to shareholders or investment in expansion of facilities		<u>\$ 80,000,000</u>

lion to pay dividends to shareholders and \$91 million to repay short and long term debt and improve the debt-equity ratio.

Thus, by this measure, Noranda in 1978 sacrificed the spending required to maintain its business in order to strengthen its financial position, but must eventually make up this shortfall if its productive capacity is not to be eroded.

It must be emphasized that this statement is intended to provide perspective and involves many statistical

estimates. There is also concern that it may understate the full impact of inflation since the Statistics Canada index used does not fully reflect the escalation that has taken place in the replacement cost of fixed assets.

It should also be noted that the \$56 million figure shown in the statement could be interpreted as indicating the amount by which Noranda's 1978 earnings were overstated due to the ravages of inflation. Earnings are taxed without adequate recognition being given to this overstatement.

# Accounting Policies

---

## **BASIS OF PRESENTATION OF FINANCIAL STATEMENTS**

The accompanying financial statements are prepared in accordance with accounting principles generally accepted in Canada and include, on a consolidated basis, the accounts of Noranda Mines Limited (the Company) and all of its subsidiaries. The Company together with its subsidiaries is referred to as Noranda. Noranda's interests in associated companies in which it has significant influence but not majority share ownership are accounted for on the basis of cost plus Noranda's equity in undistributed earnings of such companies since the dates of investment. The difference between the cost of the shares of associated companies and the underlying net book value of the assets is amortized over the life of the assets to which the difference is attributed. Other long-term investments are carried at cost less any amounts written off.

Certain subsidiary and associated companies own shares in the Company. The Company's pro rata interest in the carrying value of such shares has been deducted from shareholders' equity. Similarly, the Company's earnings per share have been calculated on the number of shares outstanding after reduction for such intercompany holdings.

---

## **TRANSLATION OF FOREIGN CURRENCIES**

Foreign currency assets and liabilities of the Company and its subsidiaries and associated companies are translated into Canadian dollars as follows: working capital at exchange rates prevailing at the end of the period; fixed and other long-term assets, long-term

debt, and depreciation provisions on the basis of historic rates of exchange; revenues and expenses (other than depreciation) at average rates during the period. Exchange translation gains and losses from these procedures are included in consolidated earnings.

---

## **INVENTORIES**

Mine products are valued at estimated realizable value and other inventories at the lower of cost and market.

---

## **FUTURES CONTRACTS**

From time to time, the Company owns futures contracts for the purchase or sale of metals and currencies. These contracts are not reflected in the Company's accounts, beyond the amount of deposit required, until maturity date although provision is made for any estimated unrealized losses.

---

## **DEPRECIATION AND DEVELOPMENT CHARGES**

Depreciation of property, buildings and equipment and amortization of development expenditures are based on the estimated service lives of the assets calculated using the method appropriate in the circumstances, for the most part straight-line for fixed assets and unit of production for development.

---

## **EXPLORATION**

Mineral and petroleum exploration expenditures are charged against current earnings, unless they relate to properties from which a productive result is reasonably certain or on which work is in process. Gains on sale or recoveries of costs previously written off are normally credited against exploration expense.

---

## **INCOME TAXES**

Under the income tax laws, some costs and revenues are included in taxable income in years which are earlier or later than those in which they are included in income reported in the financial statements. As a result of these timing differences, income taxes

currently payable normally differ from the provisions for taxes charged to earnings. The differences are shown in the consolidated balance sheet as "Taxes provided not currently payable".

Potential tax savings arising from losses incurred and investment tax credits are not reflected in earnings in the year they arise unless they are virtually certain to be realized.

---

## **INTEREST**

Generally interest expense is accrued and charged against income except interest that can be identified with a major capital expenditure program. Such interest is capitalized during the construction period.

---

## **START-UP COSTS**

Start-up costs on major projects are deferred until the facility achieves commercial production volumes. These deferred costs are written off over a reasonable period on either a straight-line or unit of production basis.

---

## **RESEARCH**

Research expense is charged against income as incurred.

---

## **ALUMINUM PLANT**

Certain of the assets and the related debt of the aluminum plant in the City of New Madrid, Missouri, while technically the property and obligation of the City, are carried on Noranda's books by virtue of its long-term lease option and unconditional guarantees.

# Consolidated Balance Sheet December 31, 1978

NORANDA MINES LIMITED

(Incorporated under the laws of Ontario)

and its consolidated subsidiaries

ASSETS	Pro Forma (Note 13(b))	1978 (in thousands)	1977 (restated)
<b>Current Assets</b>			
Cash and short-term commercial notes	\$ 23,224	\$ 1,823	\$ 21,335
Marketable investments, at cost less amounts written off (quoted market value pro forma — \$18,233,000; 1978 — \$17,143,000; 1977 — \$15,674,000)	16,829	15,829	14,942
Accounts, advances and tolls receivable	402,061	399,045	320,067
Inventories	508,254	466,009	399,603
	950,368	882,706	755,947
Investment in and advances to associated and other companies (Note 2)	353,354	410,029	387,779
<b>Fixed Assets</b>			
Property, buildings and equipment, at cost	1,878,719	1,703,027	1,573,308
Accumulated depreciation	(815,004)	(744,194)	(675,298)
	1,063,715	958,833	898,010
Other Assets (Note 3)	150,897	123,280	115,745
	<u>\$2,518,334</u>	<u>\$2,374,848</u>	<u>\$2,157,481</u>

LIABILITIES	Pro Forma (Note 13(b))	1978 (in thousands)	1977 (restated)
<b>Current Liabilities</b>			
Bank advances (Note 4(d))	\$ 133,578	\$ 133,578	\$ 206,132
Accounts payable	321,040	336,666	257,929
Taxes payable	78,868	65,801	25,235
Debt due within one year (Note 4)	65,589	65,089	99,321
	599,075	601,134	588,617
Deferred liabilities and revenues	34,338	34,338	10,321
Taxes provided not currently payable	114,093	99,984	82,758
Long-term debt (Note 4)	604,586	604,086	588,881
Minority interest in subsidiaries	165,673	150,932	128,155
<b>Shareholders' equity</b>			
Capital stock (Note 6) —	244,802	109,005	85,354
Retained earnings	789,840	789,840	685,373
	1,034,642	898,845	770,727
Less the company's pro rata interest in its shares held by subsidiary and associated companies	(34,073)	(14,471)	(11,978)
	1,000,569	884,374	758,749
	<u>\$2,518,334</u>	<u>\$2,374,848</u>	<u>\$2,157,481</u>

On behalf of the Board

A. POWIS, Director

A. J. LITTLE, Director

(See accompanying notes)

## Auditors' Report

To the Shareholders of  
Noranda Mines Limited:

We have examined the consolidated balance sheet and pro forma consolidated balance sheet of Noranda Mines Limited as at December 31, 1978 and the consolidated statements of earnings, retained earnings and changes in financial position for the year then ended. Our examination of the financial statements of Noranda Mines Limited and those subsidiaries and associated companies of which we are the auditors was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances. We have relied on the reports of the auditors who examined the financial statements of the other subsidiaries and associated companies.

In our opinion:

- (a) The accompanying consolidated balance sheet presents fairly the financial position of the company as at December 31, 1978;
- (b) The accompanying pro forma consolidated balance sheet presents fairly the financial position of the company as at December 31, 1978 after giving effect to the transactions set forth in Note 13(b);
- (c) The accompanying consolidated statements of earnings, retained earnings and changes in financial position present fairly the results of operations and changes in financial position of the company for the year ended December 31, 1978;

all in accordance with generally accepted accounting principles applied, after giving retroactive effect to the change described in note 1(b), with which we concur, on a basis consistent with that of the preceding year.

**Clarkson, Gordon & Co.**  
Chartered Accountants

Toronto, Canada, February 19, 1979.

## Consolidated Statements of Earnings and Retained Earnings

For the years ended December 31

<b>EARNINGS</b>	<b>1978</b>	<b>1977</b>
		(restated)
		(in thousands)
<b>Revenue</b>		
Metals, products, custom tolls and other	\$1,691,094	\$1,395,787
<b>Expense</b>		
Cost of metal production and products sold	1,211,309	1,036,874
Administration, selling and general expenses	101,157	94,353
Depreciation (\$78,279,000; 1977 — \$75,103,000) and development charges	82,063	83,136
Exploration and research written off	31,459	35,963
Interest — net (including long-term debt interest of \$45,646,000; 1977 — \$44,444,000)	64,842	71,856
	1,490,830	1,322,182
	200,264	73,605
Income and production taxes	90,501	22,666
Minority interest in profits of subsidiaries	24,783	12,625
	115,284	35,291
Earnings of Noranda and subsidiary companies	84,980	38,314
Share of after-tax profits in associated companies (note 2)	49,293	33,462
	134,273	71,776
Gain on sale of assets (note 11(a))	10,684	—
Aluminum plant shutdown — abnormal costs (Note 11(b))	(9,783)	—
<b>Earnings</b>	<b>\$ 135,174</b>	<b>\$ 71,776</b>
<b>Earnings per share</b>	<b>\$ 5.72</b>	<b>\$ 3.04</b>

<b>RETAINED EARNINGS</b>	<b>1978</b>	<b>1977</b>
		(restated)
		(in thousands)
<b>Balance, beginning of year (note 1(b))</b>	<b>\$ 685,373</b>	<b>\$ 641,895</b>
<b>Earnings</b>	<b>135,174</b>	<b>71,776</b>
	820,547	713,671
Dividends paid (note 6(b))	30,707	28,298
<b>Balance, end of year</b>	<b>\$ 789,840</b>	<b>\$ 685,373</b>

(See accompanying notes)

# Consolidated Statement of Changes in Financial Position

For the years ended December 31

	1978	1977
		(restated)
	(in thousands)	
Working capital, beginning of year	\$ 167,330	\$ 197,450
<b>Source of Funds</b>		
Operations —		
Earnings	135,174	71,776
Depreciation and development charges	82,063	83,136
Taxes provided not currently payable	13,075	(3,071)
Minority interest in profits of subsidiaries	24,783	12,625
Share of earnings less dividends of associated companies	(36,786)	(18,532)
	218,309	145,934
<b>Acquisition of Orchan Mines Limited (note 2(d))</b>		
Issue of Shares (net of reciprocal holdings)	16,902	—
Amount of previous investment	12,113	—
Deduct — non-current assets acquired	(16,608)	—
	12,407	—
Sale of Northwood Panelboard Limited	—	6,396
Sale of Northwood Properties Limited (note 11(a))	7,334	—
Issue of shares	4,256	16
Investments and advances	2,113	8,191
Long-term financing	35,244	1,517
Fixed asset disposals and adjustments	5,478	7,760
Increase in deferred liabilities and revenues	10,208	1,711
	295,349	171,525
<b>Application of Funds</b>		
Fixed assets (note 8)	115,083	119,565
Deferred development, exploration and other expenditures (note 8)	9,135	21,748
Investments and advances	—	15,557
Dividends paid to — shareholders	30,707	28,298
— minority shareholders of subsidiaries	6,143	4,821
Current maturities of long-term debt	20,039	11,656
	181,107	201,645
<b>Net increase (decrease) in working capital</b>	<b>114,242</b>	<b>(30,120)</b>
<b>Working capital, end of year</b>	<b>\$ 281,572</b>	<b>\$ 167,330</b>

(See accompanying notes)

# Notes to Consolidated Financial Statements

December 31, 1978

## 1. Accounting Policies

(a) The principal accounting policies followed by Noranda Mines Limited and its subsidiaries are summarized under the caption "Accounting Policies."

(b) As of January 1, 1977, the U.S. subsidiary companies adopted the LIFO basis for determining the cost of major inventories pursuant to tax rules in the U.S. which require companies to maintain the accounting for inventories on a tax basis. During 1978, the U.S. tax authorities issued a ruling exempting foreign corporations from this accounting requirement with respect to their consolidated financial statements. As a result, the company reverted to the FIFO basis of inventory cost for these companies.

This change was given retroactive treatment and net earnings for the year 1977, and the previously reported retained earnings at the end of 1977 increased by \$4,600,000.

## 2. Investments

(a) Investments in and advances to associated and other companies consist of:

	Noranda's Direct Interest	Carrying Value December 1978	1977
<i>(in thousands)</i>			
<b>Investments carried on an equity basis —</b>			
British Columbia Forest Products Limited	29%	\$ 69,082	\$ 52,209
Craigmont Mines Limited	20%	3,842	3,599
Kerr Addison Mines Limited	41%	27,444	26,454
Mattagami Lake Mines Ltd. (N.P.L.) (Note 13)	34%	43,257	37,438
Northwood Pulp & Timber Ltd.	50%	50,707	39,006
Orchan Mines Limited (Note 2(d))	—	—	11,703
Pamour Porcupine Mines, Ltd.	49%	3,651	1,591
Placer Development Ltd.	32%	71,147	68,201
Tara Exploration & Development Company Limited (Note 2(c))	41%	46,986	35,427
Frialco/Friguia Guinean Consortium	20%	19,492	20,945
Other companies		51,842	51,466
		<b>387,450</b>	<b>348,039</b>
<b>Other investments and advances —</b>			
Shares, at cost less amounts written off		11,055	10,789
Advances & other indebtedness (Note 2(c))		11,524	28,951
		<b>\$410,029</b>	<b>\$387,779</b>

(b) Included above are shares carried at a book value of \$276,040,000 which had a quoted market value of \$367,377,000 at December 31, 1978 (\$247,021,000 and \$280,647,000, respectively, at December 31, 1977). The latter amount does not necessarily represent the value of these holdings, which may be more or less than that indicated by market quotations.

(c) \$2,016,000 of advances and other indebtedness at December 31, 1978 was secured by shares of Tara Exploration and Development Company Limited.

(d) Effective December 31, 1978, the Company amalgamated with Orchan Mines Limited and continued as Noranda Mines Limited. In connection with this amalgamation 554,143 shares of the Company were issued at \$35 per share for a total of \$19,395,000.

Because shares of Orchan were held by associated companies, the Company's pro rata interest in its shares held by subsidiary and associated companies was increased resulting in net consideration of \$16,902,000

This transaction, which was accounted for by the purchase method, is summarized below:

	<i>(in thousands)</i>
Non-current assets	
Fixed — including adjustments to fair value of \$4,358,000	\$18,629
Other	3,164
	21,793
Long-term liabilities	5,185
Non-current assets — (net)	16,608
Working capital increase	12,407
Total net assets	29,015
Less investments in and advances to Orchan prior to amalgamation	12,113
Capital stock issued — (net)	<u>\$16,902</u>

(e) As of December 31, 1978, the balance of the shares in Central Canada Potash Co. Limited were purchased in consideration for a note payable over a period of approximately three years and Central Canada became a wholly-owned subsidiary of the Company. The present value of this payable at December 31, 1978 has been included with deferred liabilities.

## 3. Other Assets

	Pro Forma	1978	1977
<i>(in thousands)</i>			
Deferred development and start-up costs	\$117,525	\$ 90,952	\$ 81,295
Deferred exploration expenditures	16,161	16,161	19,074
Other deferred assets	10,849	9,805	8,149
Debenture and revenue bond discount and financing expenses, at cost less amortization	6,362	6,362	7,227
	<b>\$150,897</b>	<b>\$123,280</b>	<b>\$115,745</b>

#### 4. Debt

(a) Long-term debt:	1978	1977
	<i>(in thousands)</i>	
<b>Noranda Mines Limited —</b>		
9¾% notes due July 15, 1982	\$ 25,000	\$ 25,000
9¾% notes due November 1, 1980 (of which \$15,000,000 is payable in U.S. currency)	25,398	25,398
7½% sinking fund debentures maturing October 1, 1988	23,668	24,124
9¼% sinking fund debentures maturing October 15, 1990	35,659	36,682
9¾% sinking fund debentures maturing May 1, 1994	46,950	50,000
<b>Noranda Aluminum Inc. —</b>		
10½% secured notes repayable at various dates up to October 1, 1995 (\$80,000,000 U.S.)	81,360	81,360
5.90% industrial revenue bonds, and sinking fund issues, maturing November 1, 1993 (December 31, 1978 — \$68,050,000 U.S.; December 31, 1977 — \$70,850,000 U.S.)	72,983	76,047
8% pollution control revenue bonds due April 1, 2001 (\$10,500,000 U.S.)	10,315	10,315
9¾% notes repayable at various dates up to January 10, 1987 (\$30,000,000 U.S.)	35,229	
<b>Norandex Inc. —</b>		
5½%-10% mortgage notes payable in monthly instalments to 2002 (December 31, 1978 — \$6,485,000 U.S.; December 31, 1977, \$7,369,000 U.S.)	6,974	7,875
<b>Brunswick Mining &amp; Smelting Corporation Limited —</b>		
5.85% first mortgage sinking fund bonds, series 'A' maturing April 1, 1986	8,662	9,937
7¼% general mortgage sinking fund bonds, series 'A' maturing August 15, 1987	8,486	10,746
11% general mortgage sinking fund bonds, series 'B' maturing December 1, 1996	35,000	35,000
<b>Fraser Companies, Limited —</b>		
6½% sinking fund debentures, series 'A' maturing April 1, 1987 (December 31, 1978 — \$6,750,000 U.S.; December 31, 1977 — \$7,500,000 U.S.)	7,369	8,109
10¾% sinking fund debentures, series 'B' maturing June 1, 1992 (\$35,000,000 U.S.)	35,612	35,612
Sundry indebtedness	8,319	10,102
	466,984	446,307
Notes payable (Note 4(b))	202,191	241,895
	669,175	688,202
Debt due within one year (including notes payable of \$52,191,000 December 31, 1978; \$91,895,000 December 31, 1977)	65,089	99,321
Long-term debt	\$604,086	\$588,881

Maturities of long-term debt are as follows:

1980 — \$43,261,000; 1981 — \$20,552,000; 1982 — \$195,916,000; and subsequent \$344,357,000.

- (b) \$150,000,000 of notes payable, representing promissory notes with maturities from January to March 1979, have been classified as long-term debt to the extent of the unconditional commitment the Company has received from its bankers for contractual term credits expiring December 31, 1982.
- (c) Accounts receivable and inventory of a subsidiary have been pledged as collateral for demand loans of \$12,376,000 to that company.

#### 5. Commitments and Contingent Liabilities

- (a) Approved capital projects and financing commitments outstanding total approximately \$90,000,000 at December 31, 1978.
- (b) The Company and its subsidiaries have guaranteed or are contingently liable for repayment of loans of associated and other companies to the extent of approximately \$31,000,000 at December 31, 1978.
- (c) As at December 31, 1978 Noranda's total unfunded obligation under its pension plans is estimated at \$22,000,000. These obligations are funded as required by applicable governing legislation. In Canada, the unfunded obligations will be funded and absorbed against income through annual instalments not exceeding \$1,600,000 over periods up to fourteen years. \$11,600,000 of the unfunded obligations relating to U.S. subsidiaries, will be amortized over periods up to forty years in annual instalments not exceeding \$500,000.
- (d) The Company and certain of its subsidiaries from time to time enter into long-term lease arrangements for buildings, such arrangements currently giving rise to annual charges totalling approximately \$3,000,000.
- (e) The Company is one of twenty-nine defendants, described as uranium producers and located in various countries, to a private antitrust action instituted by Westinghouse Electric Corporation in the United States District Court alleging the existence of a conspiracy among such producers to restrain interstate and foreign commerce in uranium. A second action alleging the existence of the same conspiracy has been brought against the company and seven other defendants by the Tennessee Valley Authority. It is expected that the damages ultimately claimed by the plaintiffs will be substantial. The Company and three associated companies are among fourteen defendants in an action instituted in the Superior Court of the Province of Quebec by various groups of and individual Cree Indians for damages of \$8,034,000 and injunctive relief in respect of alleged

environmental contamination and other interference with alleged territorial rights of the Cree Indians in Northern Quebec.

The Company is defending these actions and believes it has good defences on the merits.

## 6. Shareholders' equity

### (a) Authorized Capital:

The authorized capital consists of 40,000,000 shares of no par value. In addition, a special meeting of shareholders held on December 27, 1978 approved by Special Resolution an increase in the authorized capital of the Company by the creation of 22,000,000 non-voting redeemable special shares with a par value of \$1 each redeemable at \$10 per share for use in connection with the Mattagami merger.

### (b) The issued capital stock is summarized below:

	Pro Forma Note 13(b)	December 31 1978	December 31 1977
		(shares)	
Class A Shares	27,065,027	23,185,116	22,332,853
Class B Shares	1,997,428	1,997,428	2,131,658
Total	29,062,455	25,182,544	24,464,511
Company's pro rata interest in its shares held by subsidiary and associated companies	1,509,149	950,678	882,367
During the year the following dividends were declared:			
Class A — \$1.30/share (1977 — \$1.20/share)		\$29,173,000	\$26,649,000
Class B — \$1.30/share (1977 \$1.155/share plus 15% tax on undistributed income on dividends paid prior to March 31, 1977)		2,681,000	2,708,000
Total		31,854,000	29,357,000
Less the Company's pro rata share of dividends paid to subsidiary and associated companies		1,147,000	1,059,000
Net charge to retained earnings		\$30,707,000	\$28,298,000

The following table summarizes the shares issued during the year:

Total issued at December 31, 1977	24,464,511
Issued under stock option plan	22,490
Issued under share purchase plan	141,400
Issued on amalgamation with Orchan (Note 2(d))	554,143
Total issued at December 31, 1978	25,182,544

The earnings per share calculations have been based on the weighted average number of shares outstanding, 23,646,648 in 1978 and 23,582,023 in 1977. Subse-

quent to December 31, 1978 additional shares will be issued under the merger with Mattagami as summarized in Note 13.

Classes A and B shares are voting, convertible into one another on a share for share basis and rank equally with respect to dividends and in all other respects.

(c) (i) During the year ended December 31, 1978, 22,490 shares in the Company's capital stock were issued under the Company's stock option plan for \$577,920 and under the Company's share purchase plan 141,400 shares were issued for \$3,676,400.

(ii) Under the provisions of the stock option plan options were granted during the year ended December 31, 1978, on 137,400 shares exercisable up to July, 1986 at \$25.03 per share and options on 1,700 shares were cancelled.

At December 31, 1978 options on 165,185 shares were outstanding exercisable at prices varying from \$25.03 to \$28.50 for periods up to 1986.

(d) Under the Company's share purchase plan, shares are sold to a trustee for resale to employees financed by an interest-free loan from the Company. At December 31, 1978, the amount of the loan included in accounts receivable was \$7,700,000.

## 7. Income Taxes

At December 31, 1978 certain subsidiaries of the Company had estimated loss carry forwards of approximately \$9,400,000, which have not been recognized in the accounts. Investment tax credits of \$7,700,000 are also available.

## 8. Oil and Gas Agreements

Under various joint venture agreements, other companies have agreed to participate in Noranda's exploration and development program and are obligated to contribute \$62,745,000 in order to earn and maintain varying interests in the lands covered by the agreements. The amounts shown by Noranda as expended on fixed assets and exploration have been reduced by \$44,694,000 and \$18,051,000 respectively as a result of the participation referred to above. To maintain present interests, further expenditures will be shared with Noranda in proportion to the respective interest in the program.

Under a major farm-out agreement, a subsidiary of Imperial Oil Limited may earn interests varying from 12½% to 17½% in specified lands by expending a minimum of \$150,000,000 with additional options to spend \$29,000,000. At the conclusion of this agreement the Company's direct interests could be reduced to 64.6% in the Elmworth-Wapiti properties and 60.4% in all other properties.

Under various agreements the Company has received \$7,700,000 in 1978 in respect of gas to be delivered in

future years. This balance has been included with deferred liabilities and revenues and will be brought into income when the gas is delivered.

## 9. Consolidated divisional revenues

Revenues from the main divisions of the business are set out on page 31 in the table of "Consolidated Divisional Results".

## 10. Remuneration of directors and senior officers

The aggregate direct remuneration paid or payable by the Company and its consolidated subsidiaries to directors and senior officers amounted to \$1,318,000.

## 11. Unusual Items

- (a) On September 22, 1978, Northwood Mills Limited, a wholly-owned subsidiary, disposed of its interest in two sawmills through the sale of all the outstanding shares of Northwood Properties Limited, realizing a gain of \$10,684,000.

The effect of this transaction on Noranda's financial statements is summarized below:

	<i>(in thousands)</i>
Reduction of non-current assets — (net)	(\$ 7,334)
Working capital increase — (net)	18,018
Gain on sale	<u>\$10,684</u>

- (b) The aluminum reduction plant was shut down for two months in early 1978 due to the failure of Associated Electric Cooperative, Inc. to supply power during the last stages of a coal strike in the United States. Abnormal costs totalling \$9,783,000 after tax including estimated costs of shut-down and start-up and cost of emergency power have been shown separately in the accompanying consolidated statement of earnings.

## 12. Anti-Inflation Program

The Company and its subsidiaries and associated companies in Canada were subject to, and believe they complied with, controls on prices, profits, employee compensation and shareholder dividends under the Federal Government's Anti-Inflation Program.

## 13. Subsequent Events

### (a) Merger with Mattagami Lake Mines Limited

Under a merger proposal approved by shareholders of both companies the Company acquired on January 2, 1979, the assets and business of Mattagami Lake Mines Limited in return for the issue of special shares of the Company to Mattagami. The Company has undertaken to make an offer to Mattagami shareholders to exchange one Noranda share for each two and one-

quarter Mattagami shares held. After the completion of this offer the Company will redeem the special shares in exchange for the issue of \$206,204,000 principal amount of a newly created debenture of the Company convertible into Class A shares of the Company at \$35 per share. Mattagami will immediately cause these debentures to be converted, and distribute the resulting Noranda shares to its shareholders with the effect that each Mattagami shareholder will receive one Noranda share for each two and one-quarter shares of Mattagami held. Shares issued to the Company will be cancelled.

### (b) Pro Forma Consolidated Balance Sheet

The pro forma consolidated balance sheet gives effect as of December 31, 1978 to the merger with Mattagami which will be accounted for by the purchase method, the effect of which is as follows:

- (i) The issue of 3,879,911 shares of the Company to which the directors have attributed a value of \$35.00 in exchange for the shares of Mattagami not already owned for a total consideration of \$135,797,000. Because shares of Mattagami were held by associated companies, the Company's pro rata interest in its shares held by subsidiary and associated companies increased by 558,471 shares resulting in net consideration of \$116,195,000. Details of the Company's shares outstanding after this transaction is completed are set out on a pro forma basis in Note 6(b).

- (ii) This transaction is summarized below:

	<i>(in thousands)</i>
Non-current assets —	
Fixed — including adjustments to fair value of \$57,008,000	\$104,882
Other	32,453
	137,335
Long-term liabilities	29,350
Non-current assets — (net)	107,985
Working capital increase	69,721
Total net assets	177,706
Less investments in and advances to Mattagami prior to acquisition	61,511
Capital stock issued — (net)	<u>\$116,195</u>

The results of operations of Mattagami will be included in the consolidated results of the Company subsequent to the date of acquisition. Prior to December 31, 1978, the Company's pro rata interest in the operations of Mattagami had been included in consolidated operations on the equity basis of accounting.

### (c) Proposed Sale of Bell Copper Mine

An agreement has been reached to sell the Bell Copper mine and concentrator, subject to the approval of the sale under the Foreign Investment Review Act (Canada), for a price of \$22 million plus working capital plus

up to an additional \$3 million contingent upon satisfactory expansion of the concentrator capacity by Noranda. This transaction is not reflected in the accompanying statements.

#### (d) Purchase of Aluminum Casting, Sheet and Foil Plant

Noranda Aluminum purchased an aluminum casting, sheet and foil plant in Huntingdon, Tennessee on January 2, 1979, for a price of approximately \$40 million U.S. including working capital.

## 14. Comparative Figures

Comparative figures for "fixed assets" and "other assets" on the consolidated balance sheet and for revenue on the consolidated statement of earnings have been restated to conform with the method of presentation adopted in 1978.

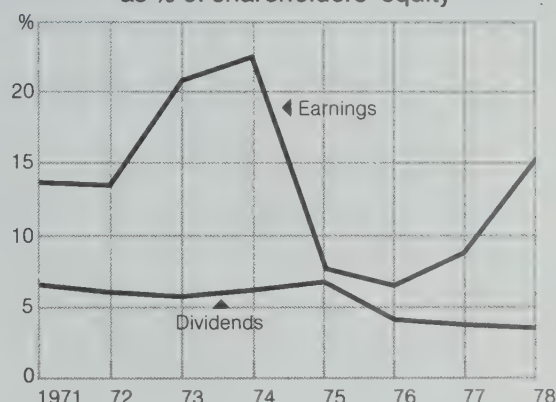
## Consolidated Divisional Results

For the years ended December 31

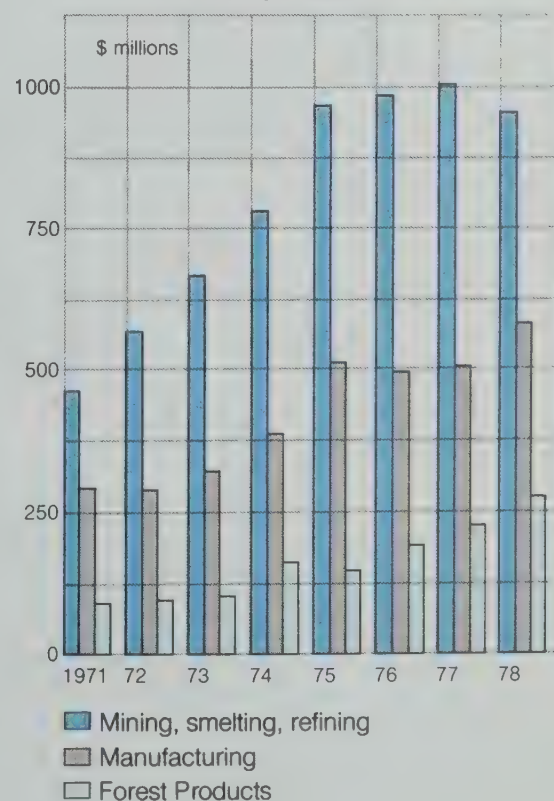
	1978	1977
		(restated)
		(in thousands)
<b>Revenue from metals, products and custom tolls</b>		
Copper mining, smelting and refining operations (1)	\$ 359,006	\$ 309,598
Other mining and metallurgical operations (2)	501,319	429,065
Total mining and metallurgical operations	860,325	738,663
Manufacturing operations (2)	801,275	704,528
Forest products operations (2)	707,384	552,364
Gross revenue	2,368,984	1,995,555
Less: sales between divisions	110,000	127,000
sales by associated companies (2)	567,890	472,768
Revenue as reported	\$ 1,691,094	\$ 1,395,787
<b>Earnings</b>		
Copper mining, smelting and refining operations	\$ 52,180	\$ 35,225
Other mining and metallurgical operations	53,587	29,283
Earnings from mining investments	1,625	3,906
Gross mining and metallurgical earnings	107,392	68,414
Less: exploration written off	13,348	16,631
Net mining and metallurgical earnings	94,044	51,783
Manufacturing operations and investments	22,517(3)	33,131
Forest products operations	61,681(4)	30,277
Earnings before borrowing cost	178,242	115,191
Less: cost of borrowing (net of tax)	43,068	43,415
Net earnings	\$ 135,174	\$ 71,776
<b>Return on net assets (5)</b>		
Net mining and metallurgical earnings	9.8%	5.1%
Manufacturing operations	3.9%	6.6%
Forest products operations	22.0%	13.2%
Earnings before borrowing cost	9.8%	6.6%

1. Consists of operations of the Horne Smelter, Geco and Bell Copper mines, Mines Gaspé and Canadian Copper Refiners.
2. Gross revenues and earnings include Noranda's share of the revenues and earnings of associated companies accounted for on an equity basis. These gross revenues include \$153,693,000 from mining and metallurgical operations, \$292,074,000 from forest operations, and \$122,123,000 from manufacturing operations in 1978. (\$145,578,000, \$214,970,000 and \$112,220,000 respectively in 1977).
3. Includes abnormal costs of \$9,783,000 from the aluminum plant shutdown.
4. Includes \$10,684,000 gain on sale of sawmills.
5. Earnings before borrowing cost expressed as a percentage of net assets employed (operating working capital, fixed assets at cost less accumulated depreciation, investments and other assets at book value).

**Earnings and Dividends**  
as % of shareholders' equity



**Net assets employed \***  
by division



## Financial Results — Economic Perspective

Over the past five years Noranda has produced revenues of slightly in excess of \$7 billion. As this amount was not sufficient to meet all spending requirements, a further \$400 million was borrowed. The total of \$7.4 billion was paid out as follows:

	<u>\$ Billions</u>	<u>%</u>
To suppliers for products and services used to produce goods for sale	3.5	47
To employees for wages and benefits	1.7	23
To maintain the business (new plant and equipment, higher inventories and customer accounts)	1.2	16
To governments as direct tax on profit	.5	7
To creditors as interest on borrowings	.3	4
To shareholders as dividends (representing a 5% return on their investment)	.2	3
	<u>7.4</u>	<u>100</u>

Examination of this table can provide a somewhat different perspective of Noranda's role in our economy than might be obtained from traditional financial statements. A number of thoughts emerge:

- With almost half the total intake of revenue and borrowings being paid out to suppliers, the strong interdependence of business activity in our economy becomes quite clear. If one business prospers, others obviously will benefit with a resulting salutary effect on employment.
- The amount paid to governments as direct tax on profits is clearly only the tip of the iceberg. Government spending is known to be in the order of 40% of our economy's Gross National Product. Applying this ratio to Noranda's spending stream would suggest that, as a result of hidden taxes and taxes paid by Noranda's employees, suppliers, creditors and shareholders, something like \$3 billion has gone to governments rather than the \$500 million shown.

- Compared with a five year average yield on long term Canada bonds of 9%, Noranda's shareholders received, in dividends, a 5% return on their equity investment, or 3% of the total receipts. This \$200 million represented about 43% of the net amount earned by Noranda during the five year period. The balance of earnings was reinvested in the business to enhance the long term value of shareholders' investment.
- The borrowing of \$400 million has, along with reinvested earnings and depreciation, helped finance the \$1.2 billion spent on maintenance and growth of the business. The rationale is that the funds borrowed are invested to produce, in the long run, earnings greater than the borrowing cost, thus providing the shareholders with some leverage on their investment. Over the past five years Noranda's average return on total capital employed was 8% and the average return on equity investment to shareholders — both paid out as dividends and reinvested — was 12%.
- Although Noranda's returns may appear to be marginally satisfactory, it must be emphasized that they express earnings achieved in recent, depreciated dollars on investments made, for the most part, at an earlier time in vastly more valuable dollars. It is evident that the returns are inadequate if they are to finance the replacement of plant, as it wears out, at today's cost which is perhaps one billion dollars more than the \$1.8 billion capital employed by Noranda at the end of 1978.
- A nagging concern for the country as a whole is whether the cash put back into our economy to replace productive capacity as it wears out and, as well, generate growth, is adequate to keep our economy alive and growing in the longer term. In Noranda's case only 16% of the total intake, one third of which was borrowed, has been invested in this way. Very little of government spending is directed towards enhancement of Canada's productive base, which is as it should be in a free society. However, the ability of our economy to support and renew its productive base is questionable when governments are consuming 40% of Gross National Product.

# Operating Interests

(December 31, 1978)

## Domestic

### Mining and Petroleum

Geco Division, Manitouswadge, Ont.	copper-zinc-silver
Mines Gaspé, Murdochville, Que.	copper
Bell Copper Division, Granisle, B.C.	copper-gold
Boss Mountain Division, Hendrix Lake, B.C.	molybdenum
Central Canada Potash, Colonsay, Sask.	potash
Orchan Division, Matagami, P.Q.	copper-zinc
Alberta Sulphate, Horseshoe Lake, Alta.	sodium sulphate
Brenda Mines, Peachland, B.C.	copper-molybdenum
Brunswick Mining & Smelting, Bathurst, N.B.	zinc-lead-copper-silver
Canadian Hunter Exploration, Calgary, Alta.	petroleum
Kerr Addison Mines, Virginiatown, Ont.	gold
Agnew Lake Mines, Espanola, Ont.	uranium
Mattagami Lake Mines, Matagami, Que.	zinc-copper-silver
Mattabi Mines, Ignace, Ont.	zinc-copper-silver
Pamour Porcupine Mines, Pamour, Ont.	gold
Schumacher Division, Schumacher, Ont.	copper-gold
Placer Development, Vancouver, B.C.	
Craigmont Mines, Merritt, B.C.	copper
Endako Mine, Fraser Lake, B.C.	molybdenum
Gibraltar Mines, McLeese Lake, B.C.	copper
Placer CEGO Petroleum, Calgary, Alta.	petroleum

### Metallurgy

Horne Division, Noranda, Que.	copper smelter
Mines Gaspé, Murdochville, Que.	copper smelter
Canadian Copper Refiners, Montreal East, Que.	
Brunswick Mining & Smelting, Belledune, N.B.	copper refiner
Canadian Electrolytic Zinc, Valleyfield, Que.	lead smelter
Federated Genco, Scarborough, Ont.	zinc reduction
Plants: Burlington and Scarborough, Ont., Lachine, Que.	metal-alloys

### Forest Products

British Columbia Forest Products, Vancouver, B.C.	
Mills: Boston Bar, Cowichan, Crofton, Delta, Hammond, Mackenzie, Tilbury and Victoria, B.C.	Lumber, pulp, newsprint, plywood and shingles
Fraser Companies, Edmundston, N.B.	
Mills: Atholville, Edmundston, Kedgwick and Plaster Rock, N.B.	boxboard, lumber and pulp
Northwood Pulp and Timber, Prince George, B.C.	
Mills: Houston, Prince George, Shelley and Upper Fraser, B.C., and Chatham, N.B.	lumber, pulp and waferboard
B.C. Chemicals, Prince George, B.C.	chlorate and tall oil

## Manufacturing

Belledune Fertilizer, Belledune, N.B.	diammonium phosphate
Canada Wire and Cable, Toronto, Ont. Plants: Toronto, Fergus, Orangeville, and Simcoe, Ont., Saint John, N.B., Montreal East, Que., Winnipeg, Man., Weyburn, Sask., New Westminster, B.C.	copper rod, wire & cable
Industrial Wire & Cable Division, Toronto, Ont. Plants: Quebec, Que., Toronto, Ont.	
Canstar Communications Division, Toronto, Ont.	fibre optics
Radionics, Montreal, P.Q.	diagnostic medical instruments
Canplas Industries, Barrie, Ont. Plants: Barrie, Ont., and New Westminster, B.C.	plastic moulding
Grandview Industries, (Rexdale) Toronto, Ont. Plants: Rexdale, Brampton and Mississauga, Ont., Montreal, Que., Weyburn, Sask., Langley, B.C.	plastic moulding and extrusion
Noranda Metal Industries, Montreal East, Que. Plants: Montreal East, Que., Fergus and Arnprior, Ont., New Westminster, B.C.	copper sheet, strip, tube and alloys
Norcast Division, Toronto, Ont. Plants: Mont Joli (2) and Moncton, N.B.	mill liners, grinding media and secondary metal
Wire Rope Industries, Montreal, Que. Plants: Pointe Claire, Que., and Vancouver, B.C.	steel wire rope, slings and strands
Gourock Division, Boucherville, Que., and Halifax, N.S.	sporting and fishing nets

## International

Bridon-American, Exeter, Pa., U.S.A.	steel wire rope
British Columbia Forest Products Blandin Paper Co., Grand Rapids, Minn., U.S.A.	paper and waferboard
Canada Wire and Cable (International) Alambres Dominicanos, Dominican Republic Cabcan, Iran Industrias Conductores Monterrey, Mexico Fadaltec, Colombia Iconel, Venezuela Nigerchin Electrical Development Co., Nigeria Termocanada Conductores Electricos, Brazil Tolley Holdings, New Zealand Tyree Canada Wire, Australia	wire and cable
Empresa Fluorspar, Mexico	fluorspar
Empresa Minera de El Setentrion, Nicaragua	gold
Fraser Companies Fraser Paper, Madawaska, Maine, U.S.A.	paper
Kerr Addison Mines Mogul of Ireland, Republic of Ireland Noranda Aluminum, New Madrid, Mo., U.S.A.	
Norandex, Cleveland, Ohio, U.S.A.	zinc-lead aluminum reduction and wire and cable aluminum building products alumina
Friguia, Republic of Guinea Noranda Metal Industries French Tube Division, Newtown, Conn., U.S.A.	specialty tube
Placer Development Marcopper Mining, Philippines McDermitt Mine, Nevada, U.S.A. Fox Manufacturing, Australia	copper mercury industrial equipment and forest products cattle
Northern Cattle, Australia Tara Exploration and Development Tara Mines, Republic of Ireland	zinc-lead

**noranda**

Noranda Mines Limited  
P.O. Box 45, Commerce Court West  
Toronto, Ont., Canada M5L 1B6

**noranda**

## NOTICE OF GENERAL MEETING OF SHAREHOLDERS

To the Shareholders:

TAKE NOTICE that a General Meeting of the Shareholders of Noranda Mines Limited ("Noranda") will be held in the Ontario Room at the Royal York Hotel in the City of Toronto, Ontario, on Wednesday, the 27th day of December, 1978 at the hour of 10:30 o'clock (Toronto time) in the forenoon to consider and, if thought fit, to confirm, with or without variation, the following Special Resolutions passed by the directors of Noranda on November 28, 1978 in order to enable Noranda, subject to such confirmation, to amalgamate with Orchan Mines Limited ("Orchan") and (either as presently constituted or, if the amalgamation of Noranda and Orchan becomes effective, as the amalgamated corporation) to merge with Mattagami Lake Mines Limited, namely:

- (i) a Special Resolution approving the Amalgamation Agreement dated November 30, 1978 between Noranda and Orchan; and
- (ii) a Special Resolution to authorize an increase in the authorized capital of Noranda by the creation of 22,000,000 non-voting redeemable special shares.

The proposed amalgamation and merger are described in the Information Circular which, together with an Information Booklet, accompanies this Notice. A copy of the Amalgamation Agreement is attached as Exhibit A to the Information Circular and a copy of the Special Resolution to authorize the increase in the authorized capital of Noranda is attached as Exhibit B thereto.

Shareholders who are unable to be present at the Meeting are requested to date, sign and return the enclosed form of proxy in the envelope provided.

DATED this 30th day of November, 1978.

By Order of the Board,

R. C. ASHENHURST  
Secretary.

# NORANDA MINES LIMITED

## INFORMATION CIRCULAR

This Information Circular accompanies the Notice of a General Meeting of the Shareholders of Noranda Mines Limited ("Noranda") to be held on December 27, 1978 and is furnished in connection with the solicitation by the management of Noranda of proxies for use at the Meeting. The solicitation will be primarily by mail but proxies may also be solicited by regular employees of Noranda. The cost of such solicitation will be borne by Noranda.

A proxy in the form enclosed with the Notice of Meeting confers discretionary authority with respect to amendments or variations to the matters identified in the Notice of Meeting.

The shares represented by such a proxy will be voted by the persons named therein and, where a choice is specified, will be voted in accordance with the specification. **Where no choice is specified such shares will be voted for confirmation of the Special Resolution approving the Amalgamation Agreement and for confirmation of the Special Resolution increasing the authorized capital of Noranda.**

A shareholder has the right to appoint a person (who need not be a shareholder) to represent him at the Meeting other than the persons designated in the form of proxy enclosed with the Notice of Meeting. Such right may be exercised by inserting the name of such person in the blank space provided in such form of proxy.

A proxy in the form enclosed with the Notice of Meeting may be revoked at any time before it is exercised.

### Voting Shares and Principal Holders Thereof

At the close of business on November 30, 1978, 22,602,794 Class A shares without par value and 2,021,457 Class B shares without par value of Noranda were outstanding. Each share, of either Class, entitles the holder to one vote at all meetings of shareholders. Shareholders of record at the time of the Meeting are entitled to vote at the Meeting.

The management of Noranda understands that Hollinger Mines Limited owns 1,801,520 Class A shares or approximately 7.4% of the outstanding shares of Noranda and that Labrador Mining and Exploration Limited, an affiliate of Hollinger Mines Limited, owns 815,310 Class A shares or approximately 3.3% of the outstanding shares of Noranda.

### Proposed Mergers

Noranda owns 45.1% of the shares of Orchan Mines Limited ("Orchan") and 34.1% of the shares of Mattagami Lake Mines Limited ("Mattagami"). Orchan and Mattagami have mines in the Matagami area of northwestern Quebec which are a major source of supply of zinc concentrates to the electrolytic zinc reduction plant at Valleyfield, Quebec. Mattagami owns a 51.67% interest in the zinc plant, Noranda owns a 22.67% interest and Orchan owns a 15.83% interest. If the mines and the interests in the zinc plant are brought under one ownership, the management of the operations can be made more rational and savings can be achieved. It is proposed that Noranda amalgamate with Orchan and merge with Mattagami in two separate transactions. Noranda will proceed with each transaction independently of the other.

Under the amalgamation proposal, Noranda and Orchan will amalgamate under The Business Corporations Act (Ontario) and continue as one corporation, also to be named Noranda Mines Limited, as described under the heading "Amalgamation of Noranda and Orchan" below. As a result of the amalgamation, the shareholders of Noranda will receive one share of the amalgamated corporation for each share of Noranda held and the shareholders of Orchan will receive one share of the amalgamated corporation for each six shares of Orchan held.

Under the merger proposal, the shareholders of Mattagami will receive one share of Noranda for each two and one-quarter shares of Mattagami held, either upon acceptance of a share exchange offer by Noranda or upon a distribution of the assets of Mattagami as part of winding up proceedings, as described under the heading "Merger of Noranda and Mattagami" below.

Assuming the amalgamation between Noranda and Orchan takes place as contemplated, the merger of Noranda and Mattagami will be a merger of the amalgamated corporation and Mattagami, and the shares of Noranda which the shareholders of Mattagami will be entitled to receive will be shares of the amalgamated corporation.

In determining the basis of conversion of Orchan and Mattagami shares into Noranda shares a variety of factors were considered. These included market prices, earnings, dividends and book values of assets. A comparison of these items for the past five years, and for the periods in 1978 indicated is shown in the tables below. Other factors considered in determining the basis of conversion included diversity and stability of sources of income, growth possibilities and nature and value of assets.

#### **Market Prices (Toronto Stock Exchange)**

Actual	Orchan		Noranda		Mattagami	
	High	Low	High	Low	High	Low
1973.....	\$ 5.95	\$ 3.95	\$59.375	\$41.50	\$20.00	\$12.75
1974.....	4.60	2.51	54.00	26.625	17.375	11.75
1975.....	3.70	2.10	39.75	27.25	18.50	13.00
1976.....	3.55	1.95	39.75	26.375	18.875	12.00
1977.....	2.65	1.60	34.375	19.625	15.00	8.625
1978 to September 30.....	5.625	1.77	36.50	20.625	12.50	8.125

Conversion Basis	Orchan times 6		Noranda		Mattagami times 2¼	
	High	Low	High	Low	High	Low
1973.....	\$35.70	\$23.70	\$59.375	\$41.50	\$45.00	\$28.69
1974.....	27.60	15.06	54.00	26.625	39.09	26.44
1975.....	22.20	12.60	39.75	27.25	41.63	29.25
1976.....	21.30	11.70	39.75	26.375	42.47	27.00
1977.....	15.90	9.60	34.375	19.625	33.75	19.41
1978 to September 30.....	33.75	10.62	36.50	20.625	28.13	18.28

#### **Earnings per Share**

	Orchan		Noranda	Mattagami	
	Actual	Times 6		Actual	Times 2¼
1973.....	\$0.73	\$4.38	\$5.17	\$2.53	\$5.69
1974.....	0.85	5.10	6.57	3.03	6.82
1975.....	0.36	2.16	2.14	1.84	4.14
1976.....	0.27	1.62	1.98	1.13	2.54
1977.....	0.25	1.50	2.85	0.88	1.98
1978 to September 30.....	0.27	1.62	3.41	0.94	2.12

#### **Dividends per Share**

	Orchan		Noranda	Mattagami	
	Actual	Times 6		Actual	Times 2¼
1973.....	\$0.40	\$2.40	\$1.40	\$0.75	\$1.69
1974.....	0.46	2.76	1.80	1.275	2.87
1975.....	0.08	0.48	2.00	1.30	2.93
1976.....	—	—	1.20	1.00	2.25
1977.....	—	—	1.20	0.90	2.03
1978 to November 30*.....	0.25	1.50	1.30	0.20	0.45

\*Includes dividends declared but not paid

## Book Values per Share

	Orchan		Noranda	Mattagami	
	Actual	Times 6		Actual	Times 2¼
1973.....	\$3.14	\$18.40	\$24.60	\$5.76	\$12.96
1974.....	3.53	21.18	29.41	7.26	16.34
1975.....	3.81	22.86	29.55	7.80	17.55
1976.....	4.08	24.48	30.33	7.94	17.87
1977.....	4.33	25.98	31.98	7.92	17.82
1978 at September 30.....	4.60	27.60	34.44	8.76	19.71

## Information Booklet

Enclosed with this Information Circular is an Information Booklet containing:

- (i) a description of the business and properties of each of Noranda, Orchan and Mattagami;
- (ii) consolidated balance sheets as at December 31, 1977 (audited) and September 30, 1978 (unaudited) and consolidated statements of earnings and retained earnings and of changes in financial position for the five years ended December 31, 1977 (audited) and for the nine months ended September 30, 1977 and 1978 (unaudited) for each of Noranda, Orchan and Mattagami; and
- (iii) pro forma condensed consolidated balance sheets as at September 30, 1978 (unaudited) and pro forma condensed consolidated statements of earnings for the nine months ended September 30, 1978 (unaudited) of Noranda and Orchan, of Noranda and Mattagami and of Noranda, Orchan and Mattagami.

## 1978 Prices of Shares

The following is a summary of the high and low prices and volumes of trading of the Class A shares of each of Noranda, Orchan and Mattagami on The Toronto Stock Exchange on a monthly basis from January 1, 1978 to November 30, 1978.

1978	Noranda			Orchan			Mattagami		
	High	Low	Volume	High	Low	Volume	High	Low	Volume
January.....	\$25.00	\$20.625	184,500	\$2.00	\$1.77	18,300	\$10.00	\$ 9.00	38,500
February.....	23.375	21.125	229,900	2.23	1.78	75,600	9.25	8.125	38,200
March.....	24.625	21.625	208,400	2.20	1.85	78,300	9.00	8.25	17,600
April.....	27.00	23.875	280,700	2.93	1.85	354,900	9.00	8.125	52,200
May.....	28.50	24.625	358,500	2.92	2.45	239,700	10.75	8.375	24,300
June.....	28.50	24.75	279,200	3.45	2.65	274,200	11.125	9.50	15,500
July.....	31.75	25.125	427,300	3.70	3.15	320,600	10.00	9.25	50,100
August.....	34.50	29.75	632,000	4.45	3.35	348,400	11.50	9.50	42,500
September.....	36.50	32.25	300,600	5.625	3.80	460,400	12.50	11.00	105,800
October.....	39.00	33.00	436,200	6.00	4.60	484,200	13.50	11.50	75,100
November 1-15..	35.50	33.25	152,600	5.125	4.30	128,800	12.50	12.00	9,500
16-30..	36.25	34.375	127,800	5.875	5.375	530,000	15.125	13.00	63,100

The last sale price of Class A shares of Noranda on November 15, 1978, the day prior to the day on which the announcement of the proposed transactions was made, was \$35.125. The last sale price on that day of Class A shares of Orchan was \$4.30 and of Class A shares of Mattagami was \$12.375.

## **Amalgamation of Noranda and Orchan**

Noranda and Orchan have entered into an amalgamation agreement ("Amalgamation Agreement"), a copy of which is attached to this Information Circular as Exhibit A. The Amalgamation Agreement is not effective until it has been approved by a special resolution of each of Noranda and Orchan.

The Amalgamation Agreement provides that Noranda Mines Limited will be the name of the amalgamated corporation. The authorized capital will be the same as the authorized capital of Noranda with the addition of the special shares to be issued and redeemed as part of the merger of Noranda and Mattagami. The issued shares of Noranda and Orchan will be converted into shares of the amalgamated corporation on the following basis: shareholders of Noranda will receive one Class A share of the amalgamated corporation for each Class A share of Noranda held and one Class B share for each Class B share held; shareholders of Orchan other than Noranda will receive one Class A share of the amalgamated corporation for each six Class A shares of Orchan held and one Class B share for each six Class B shares held; and all of the shares of each of Orchan and Noranda held by the other will be cancelled.

### ***Approval of Amalgamation***

The directors of Noranda have passed a Special Resolution approving the Amalgamation Agreement which must be confirmed by at least two-thirds of the votes cast at the Meeting. Upon approval of the Amalgamation Agreement by both Noranda and Orchan, articles of amalgamation will be delivered to the Minister of Consumer and Commercial Relations of Ontario and upon issue of a certificate of amalgamation by the Minister the amalgamation will become effective.

### ***Income Tax Considerations***

The tax effects of the amalgamation on shareholders of Noranda under the Income Tax Act (Canada) can be summarized as follows. Each holder of Class A or Class B shares of Noranda who holds such shares as capital property will, upon the amalgamation becoming effective, receive Class A or Class B shares of the amalgamated corporation on a tax-free rollover basis. Accordingly, no capital gain or loss will be realized by reason of the amalgamation. The tax-free zone rules in respect of shares of Noranda acquired or deemed to have been acquired before 1972 will apply to shares of the amalgamated corporation to the same extent as those rules were applicable to such Noranda shares. Each holder of Class A or Class B shares of Noranda who is a trader or dealer in securities will, upon the amalgamation becoming effective, have disposed of those shares for proceeds equal to the fair market value of the Class A or Class B shares of the amalgamated corporation to which he becomes entitled.

Each shareholder should satisfy himself as to the tax effects of the amalgamation on him by seeking the advice of his tax counsel.

## **Management of Amalgamated Corporation**

Following the amalgamation, the directors of the amalgamated corporation will be as follows:

<u>Name</u>	<u>Principal Occupation</u>
ALFRED POWIS	Chairman of the Board and President, Noranda Mines Limited
JAMES CHITTENDEN DUDLEY	President, Dudley & Wilkinson Inc.
LOUIS HÉBERT	Chairman, Banque Canadienne Nationale

WILLIAM JAMES	Executive Vice-President, Noranda Mines Limited
ARTHUR JOHN LITTLE	Company Director
LEONARD GEORGE LUMBERS	Chairman, Noranda Manufacturing
THOMAS HUTCHISON McCLELLAND	Chairman of the Board, Placer Development Limited
DAVID EDWARD MITCHELL	President and Chief Executive Officer, Alberta Energy Company Ltd.
ANDRÉ MONAST	Partner in the legal firm of St. Laurent, Monast, Walters & Vallières
WILLIAM STANLEY ROW	Chairman, Kerr Addison Mines Limited
WILLIAM PRICE WILDER	Executive Vice-President, Gulf Canada Limited
ADAM HARTLEY ZIMMERMAN	Executive Vice-President, Noranda Mines Limited

Following the amalgamation, the senior officers of the amalgamated corporation will be as follows:

<u>Name</u>	<u>Office</u>
ALFRED POWIS	Chairman of the Board and President
WILLIAM JAMES	Executive Vice-President
ADAM H. ZIMMERMAN	Executive Vice-President
R. C. ASHENHURST	Secretary
E. K. CORK	Vice-President—Treasurer
D. H. FORD	Vice-President—Comptroller
J. A. HALL	Vice-President—Mine Projects
K. C. HENDRICK	Vice-President—Sales
J. O. HINDS	Executive Assistant to the President
R. L. PEPALL	Consulting Counsel
R. P. RIGGIN	Vice-President—Corporate Relations
D. E. G. SCHMITT	Vice-President—Mines

## **Merger of Noranda and Mattagami**

A statutory amalgamation between Noranda and Mattagami is not possible because the corporations are incorporated in different jurisdictions. However, a merger between the corporations comparable to an amalgamation can be achieved without adverse tax consequences by the following steps.

On or about January 1, 1979, Mattagami will sell all of its assets to a new wholly owned subsidiary ("Newsub") at a price equal to the book values thereof payable by the assumption of liabilities of Mattagami and the issue of shares of Newsub. Mattagami will then sell all of the shares of Newsub to Noranda at a price of \$206,047,340 payable by the issue of 20,604,734 redeemable special shares of Noranda. The special shares will be redeemable by Noranda at an aggregate redemption price of \$206,047,340 by the issue of a debenture of Noranda in an equal principal amount. The debenture will be convertible into shares of Noranda at a conversion price of \$35 per share. The sale price is determined by reference to the value of 13,245,900 issued and outstanding shares of Mattagami at \$15-5/9 per share, and the sale price, the number of special shares and the aggregate redemption price are subject to adjustment to reflect the issuance of additional shares pursuant to the exercise of outstanding options prior to the date of sale.

Noranda will make an offer to exchange its shares for shares of Mattagami on the basis of one Class A share of Noranda for each two and one-quarter Class A or Class B shares of Mattagami held. Assuming the amalgamation between Noranda and Orchan is completed as proposed, the offer and informational material required under applicable securities legislation will be mailed to all of the shareholders of Mattagami as soon as audited financial statements of the amalgamated corporation as at the date of the amalgamation are available, expected to be late February, 1979. On or about March 30, 1979, Noranda will take up all shares of Mattagami tendered and issue Class A shares of Noranda in exchange therefor. After the share exchange is completed, Noranda will cause Mattagami simultaneously to exercise the right to convert the debenture into Class A shares of Noranda and to distribute such shares to the shareholders of Mattagami. The shareholders of Mattagami other than Noranda will receive one Class A share of Noranda for each two and one-quarter Class A or Class B shares of Mattagami held (subject in the case of non-residents to withholding tax).

### ***Increase in Authorized Capital of Noranda***

In order that Noranda may proceed with the merger in the event the amalgamation is not completed, it is proposed that the authorized capital of Noranda be increased by creating the special shares to be issued and redeemed as part of the merger. The directors of Noranda passed a Special Resolution on November 28, 1978 authorizing an increase in its authorized capital by the creation of 22,000,000 non-voting redeemable special shares, a copy of which is attached to this Information Circular as Exhibit B. The Special Resolution must be confirmed by at least two-thirds of the votes cast at the Meeting. If confirmed, the Special Resolution will only be acted upon in the event that the amalgamation with Orchan does not become effective. If the amalgamation becomes effective, the special shares will be created as part of the authorized capital of the amalgamated corporation.

### ***Approval of Merger by Mattagami***

Approval by the shareholders of Mattagami of certain aspects of the merger, specifically the sale of assets to Newsub, the sale of shares of Newsub to Noranda and the distribution of assets will be required.

## Interlocking Interests

The following table discloses the interests of the directors and senior officers of Noranda in Noranda, Orchan and Mattagami:

<u>Name</u>	<u>Noranda</u>	<u>Orchan</u>	<u>Mattagami</u>
ALFRED POWIS	Director Chairman of the Board President Shareholder	—	—
JAMES C. DUDLEY	Director Shareholder	—	—
LOUIS HÉBERT	Director Shareholder	—	—
WILLIAM JAMES	Director Executive Vice-President Shareholder	Director Vice-President Shareholder	—
A. J. LITTLE	Director Shareholder	—	—
L. G. LUMBERS	Director Shareholder	—	—
THOMAS H. McCLELLAND	Director Shareholder	—	Shareholder
D. E. MITCHELL	Director Shareholder	—	—
ANDRÉ MONAST	Director Shareholder	—	Shareholder
W. S. ROW	Director Shareholder	Shareholder	Director Shareholder
W. P. WILDER	Director Shareholder	—	—
ADAM H. ZIMMERMAN	Director Executive Vice-President Shareholder	—	Shareholder
R. C. ASHENHURST	Secretary Shareholder	—	Director Vice-President Shareholder
E. K. CORK	Vice-President— Treasurer Shareholder	Treasurer	—

<u>Name</u>	<u>Noranda</u>	<u>Orchan</u>	<u>Mattagami</u>
D. H. FORD	Vice-President— Comptroller Shareholder	—	—
J. A. HALL	Vice-President— Mine Projects Shareholder	—	Director President Shareholder
K. C. HENDRICK	Vice-President— Sales Shareholder	—	—
J. O. HINDS	Executive Assistant to the President Shareholder	—	—
R. L. PEPALL	Consulting Counsel Shareholder	—	—
R. P. RIGGIN	Vice-President— Corporate Relations Shareholder	—	—
D. E. G. SCHMITT	Vice-President— Mines Shareholder	Director President Shareholder	—

The directors and senior officers of Noranda and their associates own beneficially less than 1% of the shares of Noranda, less than 1% of the shares of Orchan and less than 1% of the shares of Mattagami.

### **Stock Exchange Listings**

Applications will be made to list the shares of the amalgamated corporation on the Toronto, Montreal and Vancouver Stock Exchanges.

Dated: November 30, 1978.

**Exhibit A**  
**to**  
**Information Circular**  
**AMALGAMATION AGREEMENT**

THIS AMALGAMATION AGREEMENT dated the 30th day of November, 1978

BETWEEN:

NORANDA MINES LIMITED, a corporation incorporated under the laws of the Province of Ontario (hereinafter called "Noranda"),

OF THE FIRST PART,

—and—

ORCHAN MINES LIMITED, a corporation incorporated under the laws of the Province of Ontario (hereinafter called "Orchan"),

OF THE SECOND PART.

WHEREAS Noranda was continued by letters patent of amalgamation dated December 15, 1964, as amended by supplementary letters patent dated December 15, 1964 and December 14, 1968 and by articles of amendment effective July 6, 1973; and

WHEREAS by articles of amendment effective July 6, 1973, the authorized capital of Noranda was divided into 39,000,000 Class A shares without par value, 999,000 Class B shares without par value and 1,000 common shares without par value of which 22,602,794 Class A shares and 2,021,457 Class B shares are issued and are outstanding as fully paid and non-assessable; and

WHEREAS Orchan was incorporated by letters patent dated March 6, 1953, as amended by supplementary letters patent dated July 30, 1957, July 20, 1961 and July 6, 1962 and by articles of amendment effective May 28, 1975 and May 20, 1977; and

WHEREAS by articles of amendment effective May 28, 1975, the authorized capital of Orchan was \$6,500,000 divided into 6,400,000 Class A shares with a par value of \$1 each, 99,000 Class B shares with a par value of \$1 each and 1,000 common shares with a par value of \$1 each of which 5,893,274 Class A shares and 165,446 Class B shares are issued and are outstanding as fully paid and non-assessable; and

WHEREAS Noranda and Orchan propose to amalgamate and continue as one corporation;

NOW THEREFORE THIS AGREEMENT WITNESSES as follows:

1. Noranda and Orchan hereby agree to amalgamate effective December 31, 1978, pursuant to section 196 of The Business Corporations Act, and to continue as one corporation (hereinafter called "the amalgamated corporation") on the terms and conditions and in the manner hereinafter set out.
2. The name of the amalgamated corporation shall be Noranda Mines Limited and it may use its name in the French language in the form Mines Noranda Limitée.
3. The objects of the amalgamated corporation shall be:
  - (a) to carry on in all its branches the business of mining, milling, reduction and development;

(b) to acquire, own, lease, prospect for, open, explore, develop, work, improve, maintain and manage mines and mineral lands and deposits, including oil and gas lands and deposits, and to dig for, raise, crush, wash, smelt, assay, analyze, reduce, amalgamate, refine, pipe, convey and otherwise treat ores, metals and minerals, including oil and gas, whether belonging to the amalgamated corporation or not, and to render the same merchantable and to sell or otherwise dispose of the same or any part thereof or interest therein; and

(c) to take, acquire and hold as consideration for ores, metals or minerals, including oil and gas, sold or otherwise disposed of or for goods supplied or for work done by contract or otherwise, shares, debentures or other securities of or in any other company having objects similar, in whole or in part, to those of the amalgamated corporation, and to sell and otherwise dispose of the same.

4. The head office of the amalgamated corporation shall be located in the Municipality of Metropolitan Toronto at Suite 4500, Commerce Court West, Toronto M5L 1B6.

5. The authorized capital and the designations, preferences, rights, conditions, restrictions, limitations or prohibitions attached to the shares of the amalgamated corporation shall be as set forth in the Schedule annexed hereto.

6. Pursuant to subsection 196(3) of The Business Corporations Act, the 2,733,862 Class A shares with a par value of \$1 each in the capital of Orchan held by or on behalf of Noranda and any shares in the capital of Noranda held by or on behalf of Orchan shall, upon the issue of a certificate of amalgamation effecting this agreement, be cancelled without any repayment of capital in respect thereof.

7. The issued and outstanding shares in the capital of Noranda and Orchan respectively, except the shares which shall be cancelled pursuant to paragraph 6 hereof, shall, upon the issue of a certificate of amalgamation effecting this agreement, be converted into issued and outstanding and fully paid and non-assessable shares of the amalgamated corporation on the following bases:

(a) each Class A share without par value of Noranda shall become one Class A share without par value of the amalgamated corporation;

(b) each Class B share without par value of Noranda shall become one Class B share without par value of the amalgamated corporation;

(c) six Class A shares with a par value of \$1 each of Orchan shall become one Class A share without par value of the amalgamated corporation; and

(d) six Class B shares with a par value of \$1 each of Orchan shall become one Class B share without par value of the amalgamated corporation.

Any holders of shares of Orchan who, after the conversion described above, shall be entitled to a fraction of one of the issued shares of the amalgamated corporation shall not be entitled to be registered on its books in respect thereof but shall be entitled to receive a bearer fractional certificate in respect of such fraction. Fractional certificates aggregating a whole share shall entitle the holder thereof to receive a certificate for a whole share and to be registered on the books of the amalgamated corporation as a shareholder in respect thereof.

8. The number of directors of the amalgamated corporation shall be twelve and the following persons shall be the first directors:

Name

ALFRED POWIS

JAMES CHITTENDEN DUDLEY

Residence Address

70 Woodlawn Avenue East,  
Toronto, Ontario.

27 East Gate Road,  
Huntington, New York.

<u>Name</u>	<u>Residence Address</u>
LOUIS HÉBERT	3468 Drummond Street, Apartment 1202, Montreal, Quebec.
WILLIAM JAMES	41 St. Leonard's Avenue, Toronto, Ontario.
ARTHUR JOHN LITTLE	70 Montclair Avenue, Apartment 604, Toronto, Ontario.
LEONARD GEORGE LUMBERS	37 Old Forest Hill Road, Toronto, Ontario.
THOMAS HUTCHISON MCCLELLAND	1716 Drummond Drive, Vancouver, British Columbia.
DAVID EDWARD MITCHELL	2914 Montcalm Crescent, Calgary, Alberta.
ANDRÉ MONAST	1270 Place de Merici; Quebec, Quebec.
WILLIAM STANLEY ROW	168 Forest Hill Road, Toronto, Ontario.
WILLIAM PRICE WILDER	179 Warren Road, Toronto, Ontario.
ADAM HARTLEY ZIMMERMAN	15 Edgar Avenue, Toronto, Ontario.

The first directors shall hold office until the first annual meeting of the shareholders of the amalgamated corporation or until their successors are elected or appointed. The subsequent directors shall be elected each year thereafter by the shareholders of the amalgamated corporation in general meeting in accordance with the by-laws of the amalgamated corporation.

9. The by-laws of Noranda shall be the by-laws of the amalgamated corporation until repealed, amended or altered.

10. Subject to the provisions of The Business Corporations Act, the following provisions shall apply to the amalgamated corporation:

- (a) two-fifths of the board of directors shall constitute a quorum of directors;
- (b) the directors of the amalgamated corporation may from time to time:
  - (i) borrow money upon the credit of the amalgamated corporation;
  - (ii) issue, sell or pledge debt obligations of the amalgamated corporation, including without limitation, bonds, debentures, notes or other similar obligations of the amalgamated corporation, whether secured or unsecured;

(iii) charge, mortgage, hypothecate or pledge all or any currently owned or subsequently acquired real or personal, movable or immovable property of the amalgamated corporation, including book debts, rights, powers, franchises and undertaking, to secure any such debt obligations or any money borrowed, or other debt or liability of the amalgamated corporation; and

(iv) delegate to such one or more of the officers and directors of the amalgamated corporation as may be designated by the directors all or any of the powers conferred by the foregoing clauses to such extent and in such manner as the directors shall determine at the time of each such delegation; and

(c) the amalgamated corporation may purchase any of its issued common shares.

11. The amalgamated corporation shall possess all the property, rights, privileges and franchises and is subject to all the liabilities, contracts, disabilities and debts of each of Noranda and Orchan as such exist immediately before the amalgamation.

12. All rights of creditors against the property, rights and assets of each of Noranda and Orchan and all liens upon their property, rights and assets shall be unimpaired by the amalgamation and all debts, contracts, liabilities and duties of each of Noranda and Orchan shall thenceforth attach to the amalgamated corporation and may be enforced against it.

13. No action or proceeding by or against either of Noranda or Orchan shall abate or be affected by the amalgamation.

14. Upon the shareholders of each of Noranda and Orchan approving this agreement, the parties hereto shall forthwith deliver to the Minister of Consumer and Commercial Relations articles of amalgamation in compliance with The Business Corporations Act for the purpose of bringing the amalgamation into effect.

15. Noranda and Orchan may, by resolution of their respective directors, assent to any amendment or variation of this agreement which the shareholders of either may approve and the term "Agreement" as used herein shall include this agreement as so amended or varied.

IN WITNESS WHEREOF this agreement has been duly executed by the parties hereto under their respective corporate seals attested by the signatures of their proper officers duly authorized in that behalf.

NORANDA MINES LIMITED

By: (Signed) ALFRED POWIS

(Seal)

And: (Signed) E. KENDALL CORK

ORCHAN MINES LIMITED

By: (Signed) D. E. G. SCHMITT

(Seal)

And: (Signed) L. J. TAYLOR

**Schedule**  
**to**  
**Amalgamation Agreement**

**Authorized Capital**

The authorized capital of the amalgamated corporation shall consist of 39,999,000 Class A shares without par value ("Class A shares") and Class B shares without par value ("Class B shares"), with the number of Class A shares being equal to the number of Class A shares of Noranda authorized on December 31, 1978 and the number of Class B shares being equal to the number of Class B shares of Noranda authorized on December 31, 1978, 22,000,000 non-voting redeemable special shares with a par value of \$1 each ("special shares") and 1,000 common shares without par value ("common shares").

1. The Class A shares and the Class B shares shall have attached thereto the following preferences, rights, conditions, restrictions, limitations or prohibitions:

(1) Subject to paragraph (2) below, the Class A shares, the Class B shares and the common shares shall participate equally as to dividends and all dividends which the directors may determine to declare and pay in any fiscal year of the amalgamated corporation shall be declared and paid in equal or equivalent amounts per share on all the Class A shares, all the Class B shares and all the common shares at the time outstanding without preference or distinction. The directors may in declaring any or all such dividends on the Class A shares, the Class B shares and the common shares provide for payment thereof in whole or in part in the manner set out in paragraph (2) below.

(2) Subject to the provisions of The Business Corporations Act, in declaring dividends the directors may provide (without making any such provision in respect of payment of dividends on the Class A shares or the common shares) for the payment, in whole or in part, of dividends on the Class B shares by way of a cash dividend out of tax-paid undistributed surplus on hand or out of 1971 capital surplus on hand as defined in the Income Tax Act (Canada) as from time to time in force, or as defined in any successor Canadian federal income tax statute; provided however that no such provision for payment may be made by the directors in respect of any such dividend on the Class B shares unless, contemporaneously with the making of such provision, the directors declare a cash dividend, payable at the same time as the said dividend on the Class B shares, on each Class A share and each common share then outstanding equal to the sum of

(a) the cash dividend payable at the time on each Class B share then outstanding, plus

(b) in the case of a dividend on the Class B shares payable out of tax-paid undistributed surplus on hand, an amount (to the nearest one-tenth of one cent) equal to the tax paid or to be paid by the amalgamated corporation and/or by one or more of its subsidiary corporations under the said Income Tax Act or predecessor statutes to create tax-paid undistributed surplus on hand in an amount equal to the dividend payable at that time on each Class B share then outstanding.

(3) Each issued and fully paid Class A share may at any time, at the option of the holder, be converted into one Class B share. The conversion privilege herein provided for may be exercised by notice in writing given to a transfer agent of the amalgamated corporation accompanied by a certificate or certificates representing the Class A shares in respect of which the holder thereof desires to exercise such right of conversion and such notice shall be signed by the person registered on the books of the amalgamated corporation as the holder of Class A shares in respect of which such right is being exercised or by his duly authorized attorney and shall specify the number of Class A shares which the holder desires to have converted. The holder shall also pay any governmental or other tax imposed in respect of such transaction. Upon receipt of such notice the amalgamated corporation shall issue certificates representing fully paid Class B shares upon the basis above prescribed and in accordance with the provisions hereof to the holder of the Class A shares represented by the certificate or certificates accompanying such notice; if less than all the Class A shares represented by any certificate are to be converted, the holder shall be entitled to receive a new certificate for the Class A shares representing the shares comprised in the original certificate which are not to be converted.

(4) Each issued and fully paid Class B share may at any time, at the option of the holder, be converted into one Class A share. The conversion privilege herein provided for may be exercised in the same manner as the conversion privilege provided for in paragraph (3) above and the provisions thereof shall mutatis mutandis apply.

(5) All shares resulting from any conversion of issued and fully paid Class A shares into Class B shares or any conversion of Class B shares into Class A shares as aforesaid shall be deemed to be fully paid and non-assessable.

(6) None of the Class A shares, the Class B shares and the common shares shall be subdivided, consolidated, reclassified or otherwise changed unless contemporaneously therewith the other classes of shares are subdivided, consolidated, reclassified or otherwise changed in the same proportion and in the same manner.

(7) Any amendment to the Articles of the amalgamated corporation to delete or vary any preference, right, condition, restriction, limitation or prohibition attaching to the Class A or Class B shares respectively, or to create special shares ranking in priority to, or *pari passu* with the Class A or Class B shares, in addition to the authorization by special resolution, may be authorized by at least two-thirds of the votes cast at meetings of the holders of the Class A and Class B shares respectively, which may be held concurrently, duly called for that purpose; the formalities to be observed with respect to the giving of notice of any meeting of the Class A and/or Class B shareholders and the conduct thereof and the quorum therefor shall mutatis mutandis be those from time to time prescribed in the by-laws of the amalgamated corporation with respect to meetings of shareholders.

(8) In the event of the liquidation, dissolution or winding up of the amalgamated corporation or other distribution of assets of the amalgamated corporation among its shareholders for the purpose of winding up its affairs, all the property and assets of the amalgamated corporation available for distribution to the holders of the Class A shares, Class B shares and common shares shall be paid or distributed equally share for share to the holders of the Class A shares, Class B shares and common shares respectively without preference or distinction.

(9) Save as aforesaid, each Class A share, each Class B share and each common share shall have the same rights and attributes and be the same in all respects and shall entitle the holder thereof to receive notice of and to attend and to one vote in respect of each Class A share, Class B share and each common share held at all annual and general meetings of shareholders of the amalgamated corporation.

2. The special shares shall have the following attributes:

(1) The amalgamated corporation may, at any time upon giving 10 days notice in writing to the holder thereof, redeem all of the outstanding special shares on payment of \$10 per share as hereinafter provided. Such notice shall set out the date fixed for redemption. On presentation and surrender at the head office of the amalgamated corporation of the certificate or certificates representing the special shares on or after the date fixed for redemption, the amalgamated corporation shall deliver to or to the order of the registered holder thereof a debenture of the amalgamated corporation (hereinafter called the "debenture") with a principal amount equal to the aggregate redemption price of such shares as payment in full of such aggregate redemption price.

The debenture shall be a fully registered debenture dated as of the date fixed for redemption, bearing interest at the rate of 5% per annum from such date and maturing on December 31, 1979 and shall be convertible, at the option of the registered holder thereof, into fully paid and non-assessable Class A shares of the amalgamated corporation on the basis of one Class A share for each \$35 principal amount of the debenture.

(2) Save as aforesaid, the holder of the special shares shall not be entitled as such to receive notice of or to attend or vote at any meeting of the shareholders of the amalgamated corporation (other than notice of meetings of shareholders called for the purpose of authorizing the dissolution of the amalgamated corporation or the sale of its undertaking or a substantial part thereof) or to participate in any dividend or other distribution of assets of the amalgamated corporation or to any other rights of shareholders except to the extent that any such rights may be authorized by at least two-thirds of the votes cast at a meeting of the holders of each class of shares then outstanding duly called for the purpose.

**Exhibit B**  
**to**  
**Information Circular**

**SPECIAL RESOLUTION TO INCREASE AUTHORIZED CAPITAL**

RESOLVED by way of Special Resolution that:

1. The Articles of Noranda Mines Limited be amended to increase the authorized capital of the Corporation by creating 22,000,000 non-voting redeemable special shares with a par value of \$1 each ("special shares") with the following attributes:

(1) The Corporation may, at any time upon giving 10 days notice in writing to the holder thereof, redeem all of the outstanding special shares on payment of \$10 per share as hereinafter provided. Such notice shall set out the date fixed for redemption. On presentation and surrender at the head office of the Corporation of the certificate or certificates representing the special shares on or after the date fixed for redemption, the Corporation shall deliver to or to the order of the registered holder thereof a debenture of the Corporation (hereinafter called the "debenture") with a principal amount equal to the aggregate redemption price of such shares as payment in full of such aggregate redemption price.

The debenture shall be a fully registered debenture dated as of the date fixed for redemption, bearing interest at the rate of 5% per annum from such date and maturing on December 31, 1979 and shall be convertible, at the option of the registered holder thereof, into fully paid and non-assessable Class A shares without par value of the Corporation on the basis of one Class A share without par value for each \$35 principal amount of the debenture.

(2) Save as aforesaid, the holder of the special shares shall not be entitled as such to receive notice of or to attend or vote at any meeting of the shareholders of the Corporation (other than notice of meetings of shareholders called for the purpose of authorizing the dissolution of the Corporation or the sale of its undertaking or a substantial part thereof) or to participate in any dividend or other distribution of assets of the Corporation or to any other rights of shareholders except to the extent that any such rights may be authorized by at least two-thirds of the votes cast at a meeting of the holders of each class of shares then outstanding duly called for the purpose.

2. The directors and proper officers of the Corporation be and they are hereby respectively authorized to execute such documents, including Articles of Amendment, and to take such other action as they consider necessary or desirable to implement this resolution.